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## SAFETY PRECAUTIONS — AVOID INJURY

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.



Always wear appropriate ear protection while using equipment.



Moving parts can crush and cut. Always keep guard(s) in place during normal operation.



Always insert power plug into a properly grounded receptacle to avoid electrical shock.



Always turn off the main power switch and disconnect the electrical cord from the power source when performing repair or maintenance on the equipment.



Do not operate the equipment without guards in place.



Lift point for equipment.



Use caution when working with this equipment.



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



Never alter, modify, or misuse the equipment.



Never enter the electrical enclosure immediately after turning off the machine power switch and disconnecting the electrical cord from the power source. High residual voltages may be present in the electrical enclosure. Read the warning label on the electrical enclosure lid before entering the enclosure.



Never stare at the bright light used for machine lighting. Bright light can damage the eye.



Never use the machine for other than what it is designed, which is crimping terminals to wire. Do not use the machine for crushing any items.

## TOOLING ASSISTANCE CENTER

**CALL TOLL FREE 1-800-722-1111 (CONTINENTAL UNITED STATES AND PUERTO RICO ONLY)**

The **Tooling Assistance 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 TOOLING ASSISTANCE CENTER

When calling the Tooling Assistance 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 Tooling Assistance Center, be ready with the following information:

1. Customer name
2. Customer address
3. Person to contact (name, title, telephone number, and extension)
4. Person calling
5. Equipment number (and serial number if applicable)
6. Product part number (and serial number if applicable)
7. Urgency of request
8. Nature of problem
9. Description of inoperative component(s)
10. Additional information/comments that may be helpful



Terminator Part Number	DESCRIPTION
2217000-1	AMP-O-LECTRIC Model G II Terminator
2217000-2	AMP-O-LECTRIC Model G II Terminator (With CQM II)
2217001-1	AMP-O-LECTRIC Model G II Terminator (With Stripping Module)
2217001-2	AMP-O-LECTRIC Model G II Terminator (With Stripping Module and CQM II)
2217002-1	AMP-O-LECTRIC Model G II Through-Splice Terminator
2217002-2	AMP-O-LECTRIC Model G II Through-Splice Terminator (With CQM II)
2844800-1	AMP-O-LECTRIC Model G II+ Terminator
2844800-2	AMP-O-LECTRIC Model G II+ Terminator (With CQM II)
2844810-1	AMP-O-LECTRIC Model G II+ Loose Piece Terminator
2844810-2	AMP-O-LECTRIC Model G II+ Loose Piece Terminator (With CQM II)
2844820-1	AMP-O-LECTRIC Model G II+ Through-Splice Terminator
2844820-2	AMP-O-LECTRIC Model G II+ Through-Splice Terminator (With CQM II)

Figure 1

## 1. INTRODUCTION



Read and understand the entire manual before using the equipment.

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



### DANGER

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



### CAUTION

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



### NOTE

Highlights special or important information.

This manual contains information on the operation, preventive maintenance, and adjustments of the AMP-O-LECTRIC Model G II and G II+ Terminator Machines (reference Figure 1).

Descriptions in this manual pertain to the controls and adjustments on the AMP-O-LECTRIC Model G II and G II+ Terminator machines only.

The various applicators that can be used in the machines are covered in applicator instruction sheets packaged with each applicator. Applicator instruction sheets provide information on applicator installation, care, and adjustment.

The specifications and requirements for the AMP-O-LECTRIC Model G II and G II+ Terminator Machines are as listed below:

<b>Max Crimp Force</b>	<b>G II Terminator</b>	22,250 Newtons [5,000 lbs]
	<b>G II+ Terminator</b>	44,500 Newtons [10,000 lbs]
<b>Nominal Frame Deflection</b>	<b>G II Terminator</b>	0.04 mm per 1,000 Newtons [.007 in. per 1,000 lb] Crimp Force
	<b>G II+ Terminator</b>	0.025 mm per 1,000 Newtons [.004 in. per 1,000 lb] Crimp Force
<b>Noise</b>		< 82 dBA typical at operator position with standard mechanical feed applicator
<b>Weight</b>	<b>G II Terminator</b>	105 Kilograms [230 lb]
	<b>G II+ Terminator</b>	116 Kilograms [255 lb]
<b>Height</b>		585 mm [23 in.] without reel supports
<b>Electrical</b>	<b>G II Terminator</b>	Nominal: 100-240 VAC‡, 50/60 Hz, Single Phase Current. Operating current is 3 amps
	<b>G II+ Terminator</b>	Nominal: 208-240 VAC◊, 50/60 Hz, Single Phase Current. Operating current is 5 amps
<b>Air</b>		620-760 kPa [90-100 psi], 2.83 liters/sec (6 scfm) when req'd for use w/air-feed applicators
<b>Physical Environment</b>	<b>Temperature</b>	4° to 40° C [40° to 104° F]
	<b>Relative Humidity</b>	Less than 95% (non-condensing)
	<b>Transportation and Storage</b>	Store in clean, dry environment after coating all surfaces lightly with rust preventing oil

‡ Acceptable Range is 90 – 265 VAC

◊ Acceptable Range is 191 – 253 VAC

Figure 2

## 2. DESCRIPTION

### 2.1. By Model

The AMP-O-LECTRIC Model G II and G II+ Terminator Machines were designed to be used as stand-alone semi-automatic bench units. They are assembled with metric hardware.



#### NOTE

Measurements are in metric units [followed by U.S. customary units in brackets] unless otherwise indicated. Some commercial items may contain non-metric hardware.

#### 1. AMP-O-LECTRIC Model G II Terminating Machine (PN 221700-[ ])

Terminating Machine PN 221700-[ ] accepts a wide variety of miniature (mini) quick-change applicators, with minor adjustments, thus providing a great selection of terminals for many applications. Figure 3 lists changeover cams required to run 1 1/8-in. stroke cams (for AMP-O-LECTRIC Model "K" terminating machines).

ORIGINAL APPLICATOR	FEED TYPE	CHANGEOVER CAM PN FOR THE MACHINES (1 5/8-in. [41.25 mm] Stroke Machines)
1 1/8-in. Stroke Applicator for Model "K" Terminating Machine	Pre-Feed	690602-6
Heavy-Duty Industrial (HD-I) Applicator	Post-Feed	690501-4

Figure 3

#### 2. AMP-O-LECTRIC Model G II+ Terminating Machine (PN 2844800-[ ])

The Model G II+ Terminator Machines (PN 2844800-[ ]) accept a wide variety of Mid-Size applicators, thus providing a great selection of terminals for many larger wire applications.

### 3. AMP-O-LECTRIC Model G II+ Terminating Machine (PN 2844810-[ ])

The G II+ Loose Piece Terminator (PN 2844810-[ ]) (Figure 4) was designed to be used as a stand-alone semi-automatic bench machine. The modifications described below allow application of loose piece terminals.

The front guard and guard insert of the standard G II+ Terminator have been modified to allow access to the sliding terminal support for loose piece terminal applications (refer to Figure 4). These guards work together with the applicator guards to protect the operator. An additional safety switch has been added to the terminator frame and the sliding terminal support. The terminator will not cycle without an applicator in place and the sliding terminal support in the closed position.

The front guard retains its keyed interlock to actuate the guard safety switch when closed.

The modified guards on the G II+ Loose Piece Terminator will work with Mid-Size Loose Piece applicators.

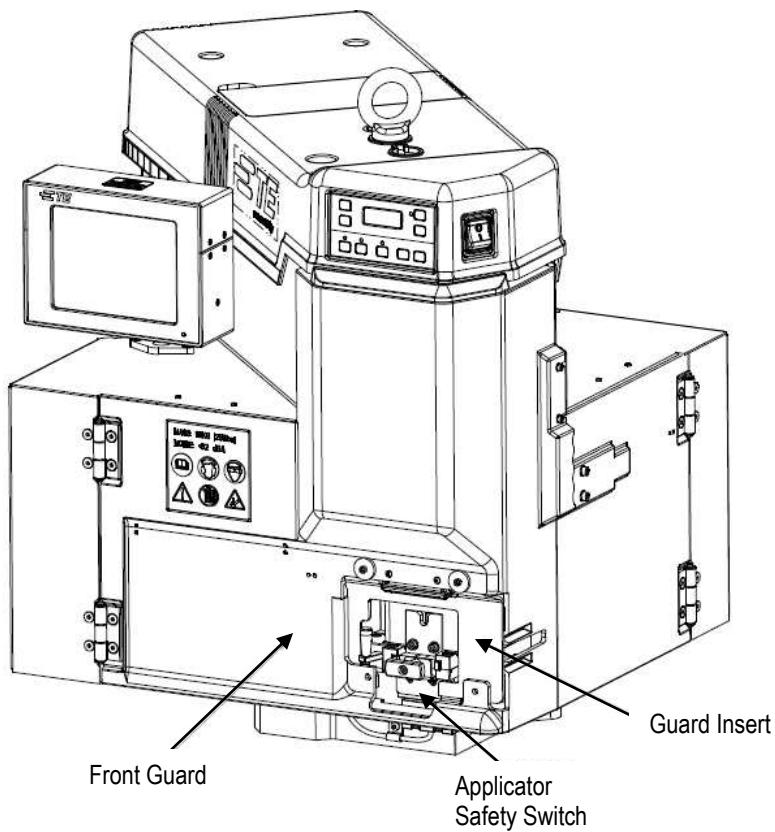


Figure 4

#### 4. AMP-O-LECTRIC Model G II+ Terminating Machine (PN 2844820-[ ])

The Model G II+ Through-Splice Terminator (PN 2844820-[ ]) (Figure 5) was designed to be used as a stand-alone semi-automatic bench machine. The modifications described below allow application of through-splice terminals and other terminals that require access to both sides of the wire crimper.

The guards of the standard G II+ Terminator have been modified to allow access to both sides of the crimper for through-splice type applications (refer to Figure 6). These guards work together with the applicator guards to protect the operator. The right guard door includes an additional metal applicator guard and safety switch. The terminator will not cycle without the applicator guard in place.

The front guard has been modified to remove the guard insert. The front guard works together with the applicator guarding to protect the operator. The front guard retains its keyed interlock to actuate the guard safety switch when closed.

The modified guards on the G II+ through-slice terminator will work with side-feed and end-feed through-splice applicators.

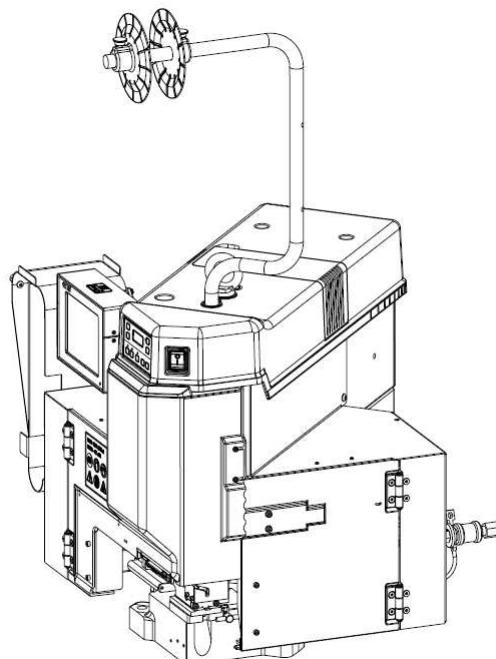


Figure 5

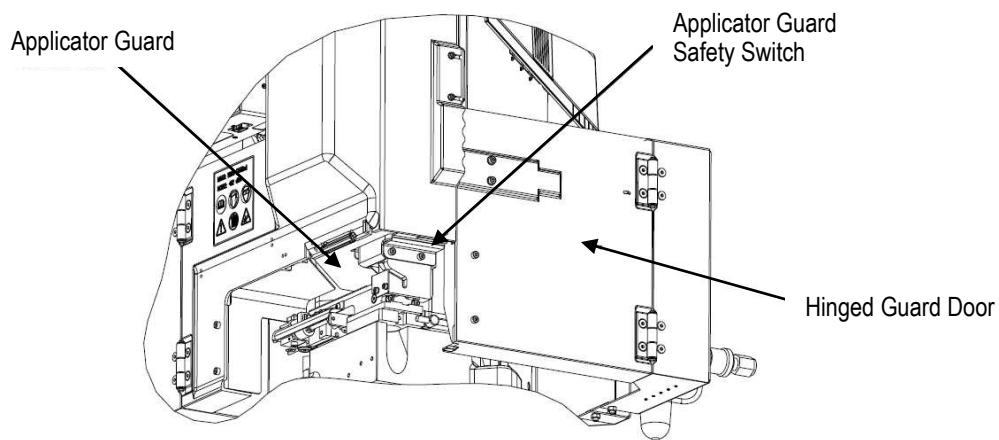


Figure 6

## 2.2. Functional

These machines provide the force required to crimp terminals in the applicator. A terminal is attached to the wire by placing the wire in the crimp area and pressing the foot switch. The machine consists of four functional areas:

1. The **motor group** includes an AC motor which drives a crankshaft. See Figure 7 and Figure 8. The motor is activated each cycle and rotates the crankshaft one full revolution. A nut on the crankshaft allows the motor and crankshaft to be cycled manually. The nut is accessed via an interlocked panel in the top cover.

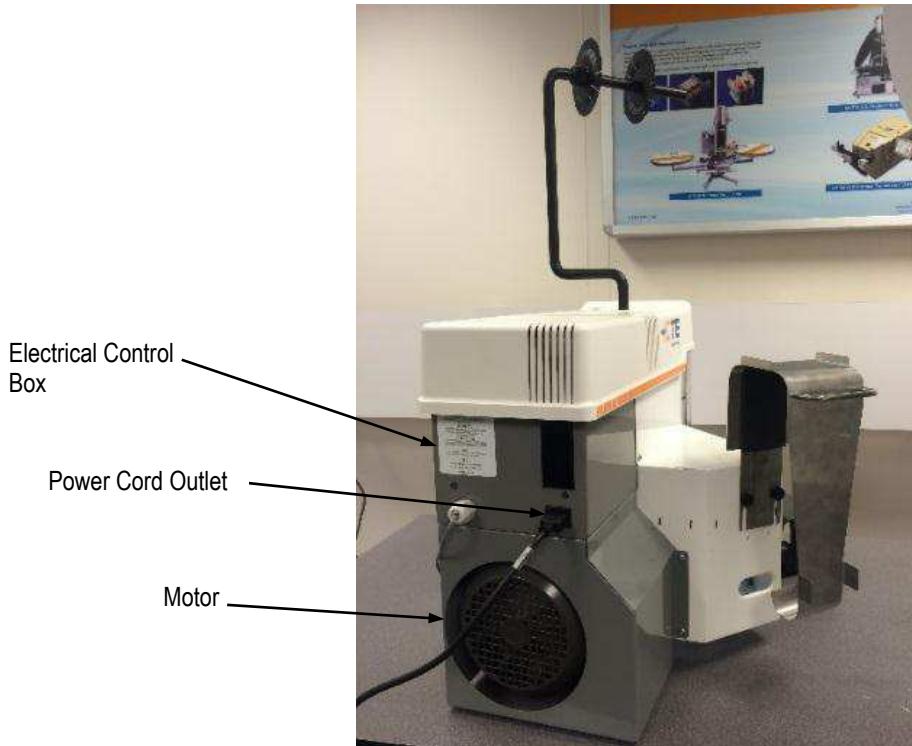


Figure 7



Figure 8

2. The **crankshaft-ram group** conveys the motor rotational force to the up-and-down action of the ram for driving the applicator during the crimping cycle.
3. The **base plate** provides the mounting surface on which the applicator is installed. The quick-release latching feature permits fast, easy installation and removal of the applicator. See Figure 9.
4. The **crimp height adjustment group** uses an eccentric located in the ram linkage, along with detented stops in the mechanism to adjust the crimp height. Indexing the mechanism in either direction will change the crimp height in increments of approximately 0.01 mm [.0004 in.] per step. Refer to Figure 9 for the Precision Crimp Height Adjustment Mechanism.

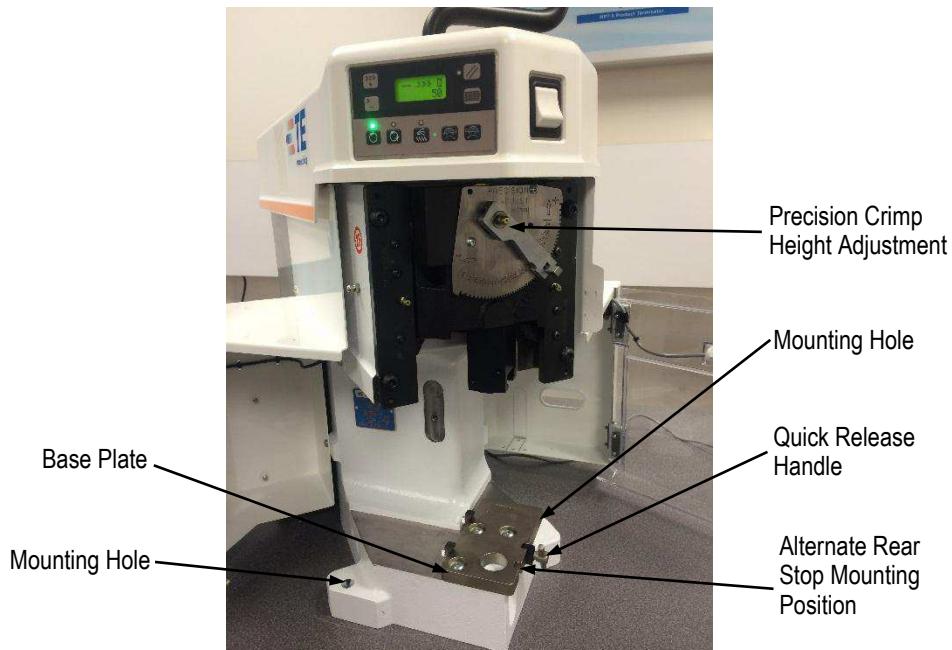


Figure 9

### 2.3. Electrical

The AMP-O-LECTRIC Model G II and G II+ Terminating Machine electrical components consist of the operator control panel, the motor, and the CPU/motor controller and safety circuit package. The G II Machines (PN's 2217000-[ ], 2217001-[ ], 2217002-[ ]) operate on 100-240 VAC, 50-60 Hz, single-phase current with ground. The machine will automatically detect the supply voltage and adjust the controller accordingly.

The G II+ Machines (PN 2844800-[ ], PN 2844810-[ ], and PN 2844820-[ ]) operate on 208-240 VAC, 50-60 Hz, single-phase current with ground.

The operator control panel (Figure 10) is mounted on the top of the machine frame. The control panel consists of a nine button membrane key pad and a two line by eight column display. The membrane key pad has icons representing the function of each button.

A main power switch/circuit breaker (see Figure 10) is located on the front of the control panel. The main power switch/circuit breaker connects ac power to the control system. The CPU/motor controller and safety circuit are located in the electrical control box.

### 2.4. Machine Guard

A two-piece guard is installed to provide protection for the operator while maintaining proper visibility of the work area. The guard swings open to allow easy access for applicator installation and setup. A safety switch on the guard prevents machine operation if the guard door is open.

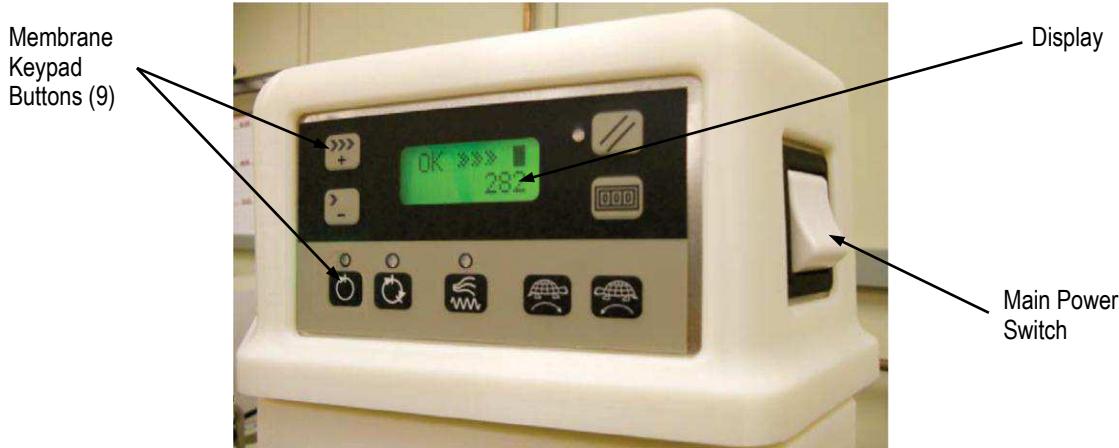


Figure 10

### 3. RECEIVING INSPECTION AND INSTALLATION

#### 3.1. Receiving Inspection

These machines are thoroughly inspected during and after assembly. A final series of inspections is made to insure the proper machine functioning before packaging and shipping.

To protect against damage that may have occurred during shipment, remove the machine from the crate (paragraph 3.2.) and carefully inspect the machine for damage. If damage is evident, file a claim against the carrier and notify TE immediately.

#### 3.2. Installation

Remove all mounting bolts securing the machine to the shipping pallet. The lift point of the machine is accessible from the top of the machine cover. Install lift ring (see Figure 11) on top of the machine.

**NOTE**

Lift ring (M12 x 20 eye bolt); reference TE PN 1428156-1.



Lift point for equipment.

**CAUTION**

Install the lift ring carefully. A 19.05-mm [.75-in.] thread length engagement is required for the lift ring to support the machine.

Attach a suitable hoist to the lift ring, lift the machine, and place it in the selected operating location.

Insert the reel support post into the appropriate hole on top of the machine until the roll pin engages a groove in the machine frame.

Attach the terminal strip guide included with the machine with the two thumbscrews supplied. Mount the guide on the left guard for side-feed applicators. Mount the guide on the right guard for end-feed applicators.

The G II and G II+ machines are supplied with several power cords to accommodate various AC plug configurations. In the event that none of the supplied cords is compatible with the available AC outlet, a power cord can be fabricated using a suitable and appropriately rated power plug. The power cord colors and plug connections are defined below:

Brown	= L1
Blue	= L2 / N
Green/Yellow	= PE Ground (Protective Earth)

Connect the power cord to a suitable electrical supply.

**NOTE**

The G II (PN 2217000-[ ]) machine will automatically detect the supply voltage and adjust the controller accordingly.

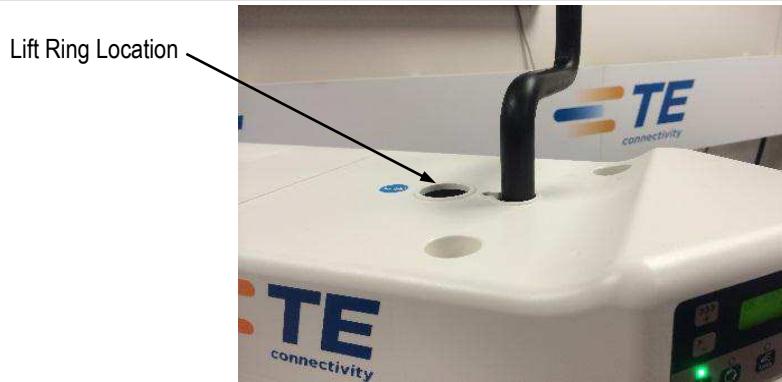


Figure 11

### 3.3. Considerations Affecting Placement of Bench Machines (Figure 12)

The location of the machine in relation to the operator's position is extremely important in terms of both safety and maximum efficiency. Studies have repeatedly shown that operator fatigue will be reduced, and greater efficiency achieved, if:

1. the bench is of appropriate height, preferably with sound-deadening rubber mounts;
2. the machine is properly located on the bench with ample work areas on both sides to facilitate work flow;
3. the operator uses a swivel chair with padded seat and back rest which are independently adjustable; and,
4. the foot switch, on machines so equipped, is placed on a rubber mat to maintain its movability, while preventing it from sliding unintentionally.

Figure 12 illustrates proper machine location, operator position, and recommended foot switch position.

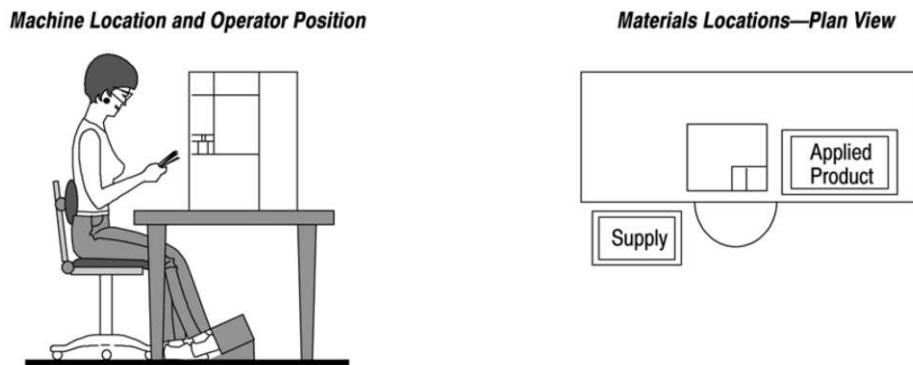


Figure 12

#### A. Bench

The bench to be used should be of sturdy construction, preferably with rubber mounts to minimize noise. A height of 762 to 812.8 mm [30 to 32 in.] is the most suitable for operator comfort and convenience. This height allows the operator to rest both feet on the floor, thereby providing for the shifting of weight and leg position.

#### B. Machine Mounting and Location on Bench

The machine should be located near the front of the bench with the "target area" (tooling area where the product is applied) not more than 152.4 to 203.2 mm [6 to 8 in.] -- minimum 50.8 mm [2 in.] from the front edge. This location will eliminate unnecessary operator motion and help to avoid back strain and fatigue.

Orientation of the machine should be such that the "target area" is facing the front of the bench and is parallel to the front edge (access to the back of the machine MUST also be provided).

**DANGER**

*Machines should be securely bolted to the bench using the machine mounting holes shown in Figure 9. Hardware is customer supplied. Machines should not extend beyond the front of the bench.*

**C. Operator's Chair**

The operator's chair should swivel, and have independent seat height and back rest adjustments. The seat and back rest should be padded, and the back rest should be large enough to provide support both above and below the waist line.

In use, the chair should be far enough under the bench so the operator's back is straight and supported by the back rest.

**D. Foot Switch**

When the operator is correctly positioned in front of a machine equipped with a foot switch, the foot should rest on the switch comfortably. The foot switch should be movable, so that its location can be readily changed when the operator shifts position to minimize fatigue. Placing the switch on a rubber mat keeps it movable while preventing unintentional sliding.

The preferred foot switch location varies to some extent among operators. Some operators prefer the switch located so that their foot rests on the switch when their feet are in the natural sitting position (calf of leg perpendicular to the foot). Others prefer the leg to be slightly in front of the natural position. The important thing to remember is that the foot should be at approximately 90° (right angle) to the calf when resting on the switch. Those operators who prefer the foot switch slightly in front of the natural position may require a wedge-shaped block placed under it.

**E. Scrap Removal**

A suggested method of scrap removal: place a tray on the right side of the machine, under the cast slot in the frame, to capture the scrap chips.

**4. OPERATION****4.1. Applicator Installation**

Install the proper applicator in the quick-change mounting base as follows:

**CAUTION**

*Make sure that the precision adjustment lever has been returned to the "0" position before installing the applicator. Be sure that the applicator has the proper feed cam prior to installation.*

**NOTE**

*Applicators from AMP-O-LECTRIC Model "K" terminating machines and Model "T" terminating machines can be used in these machines by using a special replacement cam. Refer to Figure 3.*

1. Loosen the quick-release T-handle (see Figure 9) and slide the applicator base clamp down.
2. Place the applicator on the quick-change base plate, then slide it back until the two notches in the applicator base engage the stops at the back of the quick-change base plate. At the same time, guide the ram post into the ram post adapter.
3. Slide the applicator base clamp UP and re-tighten the quick-release T-handle to secure the applicator in place.

**NOTE**

*When using Applicator 567200-2 (originally intended for use with AMP-O-LECTRIC Model "K" terminating machine), loosen the quick-release T-handle, slide down the applicator base clamp, and remove the rear stop located on the left side of the base plate. Install the rear stop (PN 354561-1), supplied with the air feed kit, at the alternate mounting position on the base plate. See Figure 9.*

4. Set the crimp height and insulation crimp discs so that the letters and numbers on the applicator pad align with the front pad on the ram post adapter.

5. If the applicator is an air-feed type, move the Air Supply Slide Valve (see Figure 23) to the "Air OFF" position. Connect the applicator airline to the appropriate air valve connection (see Figure 23) located under the right side guard.

**NOTE**

*Quick Disconnect Coupling PN 23238-1 is required to run air-feed applicators.*

6. Adjust the reel support for side-feed or end-feed product, depending on the applicator being used.
7. Mount the terminal strip guide on the left sheet metal guard for side-feed product, or on the right sheet metal guard for end-feed product, depending on the applicator being used.
8. Mount the terminal reel on the reel support. Thread the terminal strip through the guard and into the applicator in accordance with the instruction sheet included with the applicator. If necessary, adjust the lubricator bowl.
9. Align the product reel to the applicator by adjusting the reel flanges.
10. Close the guard.
11. If the applicator is an air-feed type, move the Air Supply Slide Valve (see Figure 23) to the "Air On" position.

**NOTE**

*The guard door must be closed to enable machine operation. See paragraph 2.4.*

## 4.2. Control Panel

The basic control panel operation is as described in Figure 13. The control panel will be used to set up and operate the machine.

### 4.3. Mode Selection

The three basic modes of operation for this machine are: Full-Cycle, Split Cycle, and Jog (see Figure 13).

#### 1. Full-Cycle Mode

Depressing the footswitch (with the guard closed) causes the crankshaft to be rotated (at a speed defined by the speed control buttons), through a complete revolution. This completes one full machine cycle.

#### 2. Split Cycle Mode

Depressing the footswitch once (with the guard closed) causes the crankshaft to be rotated (at a speed defined by the speed control buttons), to the split cycle position. Depressing the footswitch a second time causes the crankshaft to be rotated through the bottom position and back to the top position to complete the machine cycle.

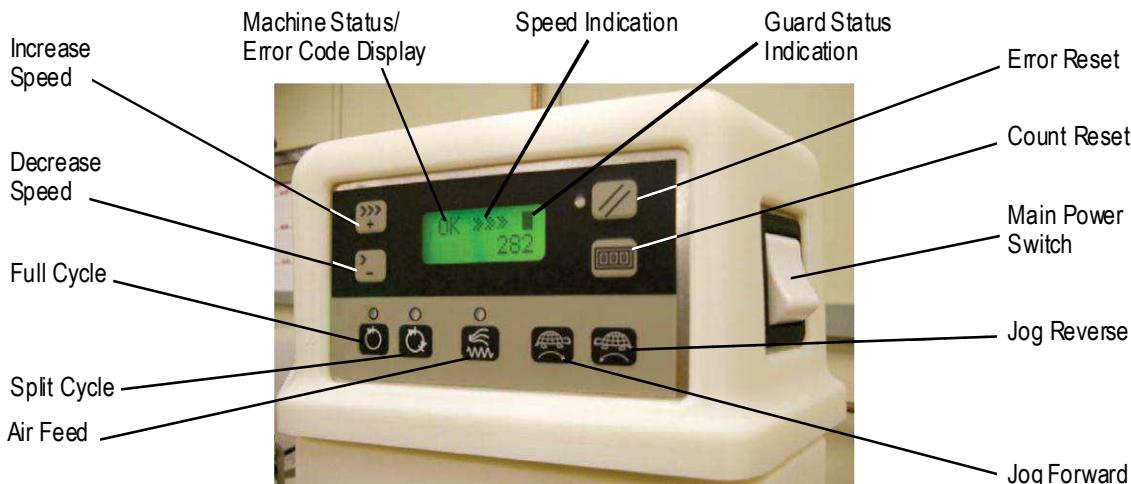
#### 3. Jog Mode, Forward/Reverse

Pressing either Jog button causes the crankshaft to be rotated at a reduced speed in the forward or reverse direction until the Jog button is released or the crankshaft completes the cycle. If the Jog button is released in mid-cycle and pressed again, the crankshaft will continue to rotate in the forward or reverse direction at the reduced speed. If the machine does not complete the cycle, either adjust the speed control buttons (as described below), or complete the cycle using the footswitch (at a speed determined by the speed control buttons) after the Jog button has been pressed and released.

Holding the Jog button down for an extended period without completing the cycle will cause an error. To clear the error, clear the problem area, and then press the Error Reset button. If the motor is stalled, it may be necessary to manually cycle the machine to the home position. Refer to the CAUTION and DANGER statements below for the proper manual cycling procedure.

**CAUTION**

*While in the Jog mode, attempting to complete a crimp cycle with terminals and wire in the applicator may cause the motor to stall. Although the machine can terminate some smaller terminals and wire, it may be necessary to turn "off" the machine and cycle manually to the home position. This can be done by opening the top interlocked cover and placing a customer-supplied (22mm) wrench on the crankshaft nut and manually rotating the crankshaft. Be sure to remove the wrench and re-install the top cover before attempting to operate the machine (machine will not run with cover removed). See Figure 8.*



**Speed Indication** -- Each ">" represents a portion of the full operation or jog speed setting. Minimum speed is denoted with a single ">". Maximum speed is denoted by ">>>>".

**Machine Status / Error Code Display** -- Displays "OK" if there is no error code being displayed or "ERRxxx" when an error has occurred. The "xxx" represents a number corresponding to an error described in the error code table (Figure 17).

**Guard Status Indication** -- A solid "■" indicates that the guard and top interlocks are closed. An open icon in this display indicates that one of the interlocks is open. The motor will not run when the guard interlocks are open.

Figure 13

#### 4.4. Setup

Install a miniature applicator and terminals in accordance with paragraph 4.1.

1. Turn on the main power using the switch located on the front of the control panel.
2. Be sure the guard is closed.
3. Jog the machine (as described in paragraph 4.3.3.) through a complete crimp cycle (wire should not be used during this step of the Setup process).



##### NOTE

*The G II and G II+ Machines should be able to jog through the terminal at maximum jog speed.*

4. Inspect the crimped terminal to verify that the terminal is being positioned properly within the applicator.
5. Correct for any positioning errors in accordance with the applicator instruction sheet, and repeat Steps 2 and 3 until a terminal is properly positioned.
6. Place a prepared wire in the crimp area and press the foot switch.
7. Inspect the completed crimp and make adjustments as necessary.

#### 4.5. Adjusting Motor Speed

The speed of the motor is adjusted using the Decrease Speed and Increase Speed buttons on the membrane keypad (see Figure 13). The Decrease and Increase buttons are used to adjust the motor speed for Full-Cycle, Split Cycle, and Jog modes. The speed setting in Full and Split Cycle modes is independent from the speed setting used in the Jog mode. Both speed settings are retained in memory by the CPU / motor controller. During Full and Split Cycle modes the last set motor speed is on the display. When the Jog button is pressed, the display will change to show the last set Jog mode speed. The Jog mode speed will continue to be displayed until the footswitch is pressed to change to Full or Split Cycle modes.

In Full and Split Cycle modes, a single “>” shown on the display indicates the motor speed is set for 60% of the maximum operating speed value. Each additional “>” on the display increases the motor speed by 8%.

In Jog mode, a single “>” shown on the display indicates the motor speed is set for 10% of the maximum operating speed value: each additional “>” shown increases the motor speed by 10%.

#### 4.6. Crimp Height Adjustment

Refer to the instructions provided with the applicator to perform this adjustment. Refer to Paragraph 6.2.A. for procedures to adjust the crimp height using the machine precision adjustment feature.

#### 4.7. End-Feed/Side-Feed Applicator Conversion

When changing from an end-feed applicator to a side-feed applicator (or from a side-feed applicator to an end-feed applicator), the reel support assembly must be moved to the opposite side of the machine. With the terminal reel removed, lift and rotate the reel support bar to the opposite side of the machine. Mount the terminal reel on the reel support and load the terminal strip into the applicator. Remove the metal terminal lead-in and thumbscrews and move to the opposite side of the machine. Move the machine lubricator bowl to the opposite side of the machine as required.



##### NOTE

*Lubricator Bowl Assembly PN 354550-3 is an optional accessory. When using an Ocean Side-Feed or End-Feed applicator, the lubricator assembly part numbers are 2119955-1 and 2119955-2, respectively.*

## 5. PREVENTIVE MAINTENANCE

Preventive maintenance will keep the machine in good working order and ensure maximum reliability and service from all of its components.

**DANGER**

*To avoid personal injury, electrical and pneumatic power must be DISCONNECTED at the source prior to maintenance.*

**DANGER**

*The CPU/Motor Controller Assembly maintains high voltage for a period of time after power has been removed. Disconnect the power source and wait several minutes before removing the screws to access the assembly.*

### 5.1. Cleaning

Clean any debris from the applicator area daily.

**DANGER**

*Compressed air used for cleaning must be reduced to less than 207 kPa [30 psi] and effective chip guarding and personal protective equipment (including eye protection) must be used.*

If an air-feed assembly is installed, check and replace the air filter element, if necessary.

Wipe off the guards with a clean soft cloth.

**CAUTION**

*DO NOT use any solvent to clean the guards. Solvent could cause irreparable damage.*

### 5.2. Lubrication

The moving parts of the machine require regular lubrication to ensure reliable service and long life. Preferred greases are Chevron Ultra-Duty EP NLGI 2, Chevron Ulti-Plex EP NLGI 2, and Caltex Ultra-Duty EP NLGI 2.

**NOTE**

*Contact TE Engineering for 2<sup>nd</sup> choice alternates.*

**NOTE**

*For operation in temperatures below 10° C [50° F], it will be necessary to use a No. 1 grease.*

**CAUTION**

*It is important to only use Lithium-based grease with extreme pressure (EP) additives.*

Every 250,000 cycles, apply grease (using a grease gun) to the fittings identified in Figure 14, as follows:

- ◆ the left side of the ram assembly,
- ◆ the right side of the ram assembly,
- ◆ the left side of the frame just behind the ram assembly, and

**NOTE**

*For best distribution of grease around the bearing, give one pump each while ram is near the top and bottom of the stroke.*

- ◆ the crimp height adjuster pivot pin

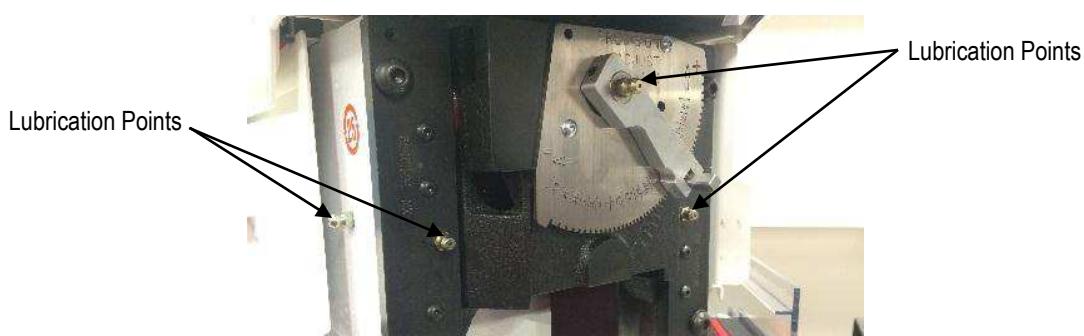


Figure 14

Chevron and Ulti-Plex are trademarks of their respective owners.

### 5.3. Safety System Check

A periodic check of the safety system should be performed to verify integrity of the system. Perform the following check at least once per month.

1. Power ON the system.
2. Place the system in Diagnostics Mode (see paragraph 8.2 "Diagnostics" in the Troubleshooting section of this Manual).
3. Close all the guards - Machine Guard, Top Guard, and Insert Guard (if equipped) or Loose Piece Guard (if equipped).
4. On the control panel display, verify that the Guard, Top and Insert Input Identifiers are on and that the Safety+24 Input Identifier is ON. Reference Figure 15.

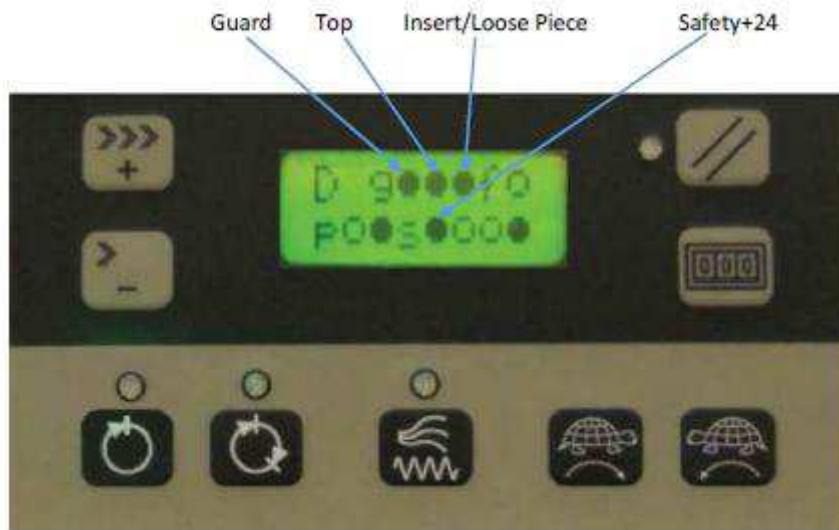


Figure 15

5. Open the Machine Guard. Verify that the Guard, Top and Insert Identifiers are OFF. Verify that the Safety+24 Input Identifier is OFF.
6. Close the Machine Guard. Verify that the Guard, Top and Insert Input Identifiers are ON and that the Safety+24 Input Identifier is ON.
7. Open the Top Guard. Verify that the Guard Input Identifier is ON and the Top and Insert Input Identifiers are both OFF. Verify that the Safety+24 Input Identifier is OFF.
8. Close the Top Guard. Verify that the Guard, Top and Insert Input Identifiers are ON and that the Safety+24 Input Identifier is ON.
9. Open the Insert Guard (if equipped) or Loose Piece Guard (if equipped). Verify that the Guard and Top Input Identifiers are both ON. Verify that the Insert Input Identifier is OFF. Verify that the Safety+24 Input Identifier is OFF.
10. Close the Insert Guard (if equipped) or Loose Piece Guard (if equipped). Verify that the Guard, Top and Insert Input Identifiers are ON and that the Safety+24 Input Identifier is ON.



#### DANGER

*If the preceding checks cannot be verified, DO NOT operate the machine. Failure to verify these systems checks indicates a potential problem with the safety system. Contact TE Field Engineering personnel for assistance.*

## 6. ADJUSTMENTS

The following adjustments are necessary to maintain the machine in operating condition, and to set up the machine after replacing parts.



### DANGER

*To avoid personal injury, ALWAYS disconnect electrical and air supplies before performing adjustments.*

### 6.1. Shut Height

#### A. Measuring

The shut height is the distance between the bottom surface of the ram post adaptor and the top surface of the machine base plate as shown in Figure 16.



#### NOTE

*Shut Height Gage PN 679655-2 (see Figure 16 table) is recommended for measuring shut height (refer to 408-8535 for instructions on use of the gage).*

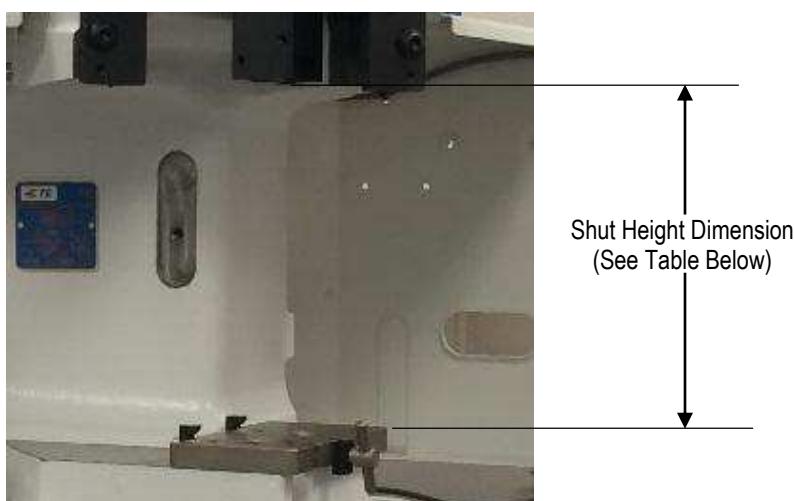
1. If installed, adjust the manual precision adjustment lever to the "0" setting.
2. Remove the top interlocked cover by pulling straight up.
3. Place a customer supplied (22 mm) wrench on the crankshaft nut. Use the wrench to manually rotate the crankshaft.



#### NOTE

*Be sure to remove the wrench and re-install the top interlocked cover before operating the machine. The machine will not run until the cover is in place.*

4. Follow the procedure for measuring the shut height as described in 408-8535.



Shut Height Gage	Shut Height Dimension	Applicator Type
679655-2	$135.79 \pm 0.025$ [5.346 $\pm$ 0.010]	TE-Type

Figure 16

#### B. Adjustment

The shut height is pre-set at the factory and should not require further adjustment unless it is necessary to replace parts. Before you make any changes to the machine, contact your local Field Service Representative, or call the Tooling Assistance Center at 1-800-722-1111.



#### CAUTION

*NEVER attempt to adjust the shut height without FIRST trying an applicator that is known to produce terminations of the correct crimp height. If this applicator produces correct terminations, the trouble is in the original applicator and the shut height MUST NOT BE CHANGED.*

If it is determined that the shut height must be adjusted, use the following procedure:

**DANGER**

*To avoid personal injury, ALWAYS turn "off" the machine and disconnect the power supply to the machine before making any adjustments. If applicator is an air-feed type, DISCONNECT air lines to valve located on the right side of the machine.*

1. Check shut height as described in paragraph 6.1.
2. If the shut height is incorrect, proceed as follows:
  - a. Remove the two socket head cap screws which secure the ram post adaptor. Remove the ram post adaptor and shims. Change the shim thickness as required to adjust the shut height. Shims contain .051-mm [.002-in.] peel-type laminations.
  - b. Re-install the ram post adaptor. Insert both screws in the ram post adaptor and place the shims over the screws and onto the adaptor post.
  - c. Re-install the socket head cap screws into the ram assembly to secure the ram post adaptor. Retighten the screws.
3. Repeat Steps 1 and 2 as necessary until the proper shut height is attained.

**NOTE**

*If additional shims are required, order TE PN 1338618-1.*

*The miniature applicator is an integrated assembly consisting of upper tooling, lower tooling, and adjustment mechanisms.*

*The applicator requires a fixed shut height; that is, the distance between the bottom of the ram and the base mount when the ram is FULLY bottomed. The required adjustments for crimp height are made by using the wire and insulation discs within the applicator. Refer to the instruction sheet supplied with the applicator for adjustment procedures.*

## 6.2. Crimp Height

### A. Adjustment Using Precision Adjustment Mechanism

**CAUTION**

*To avoid damaging applicator, ALWAYS return precision adjustment lever to "0" position when finished using the applicator.*

1. Adjust the manual precision adjustment lever to "0" by pulling the lever away from the pivot pin. Lock the lever in place by releasing it.
2. Install the applicator into the machine as described in paragraph 4.2.
3. Cycle the machine to crimp three sample terminations. Check the crimp height of the samples. If the crimp heights are not correct, adjust the crimp height according to Step 4.
4. Adjust the crimp height by moving the precision adjustment lever:

Right to increase crimp height; left to decrease crimp height (see Figure 17)

**NOTE**

*Moving the precision adjustment lever in either direction will change the crimp height by approximately 0.010 mm [.0004 in.] per step.*

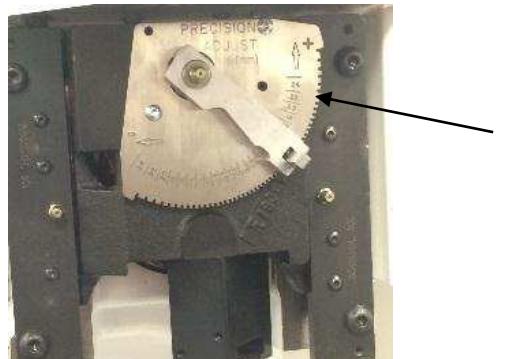


Figure 17

5. Repeat Steps 3 and 4 until the appropriate crimp height is attained.

**CAUTION**

To avoid damaging the applicator, *ALWAYS* return the manual precision adjustment lever to the "0" position when finished using the applicator.

### 6.3. Guard Insert

A guard insert is supplied with the machine. Some applications may require a special insert. See Figures 18, 19, and 20 for available guard inserts.

The guard contains two slots into which the inserts can be placed: the rear slot places the insert close to the applicator; the front slot places the insert farther away from the applicator. The type of insert used determines which slot is to be used. An insert placed into the wrong slot cannot be secured in place.

**NOTE**

Some special inserts are designed to mount in the standard insert slot. These inserts have the threaded holes at the top corners and should be installed in accordance with the instructions for the standard insert.

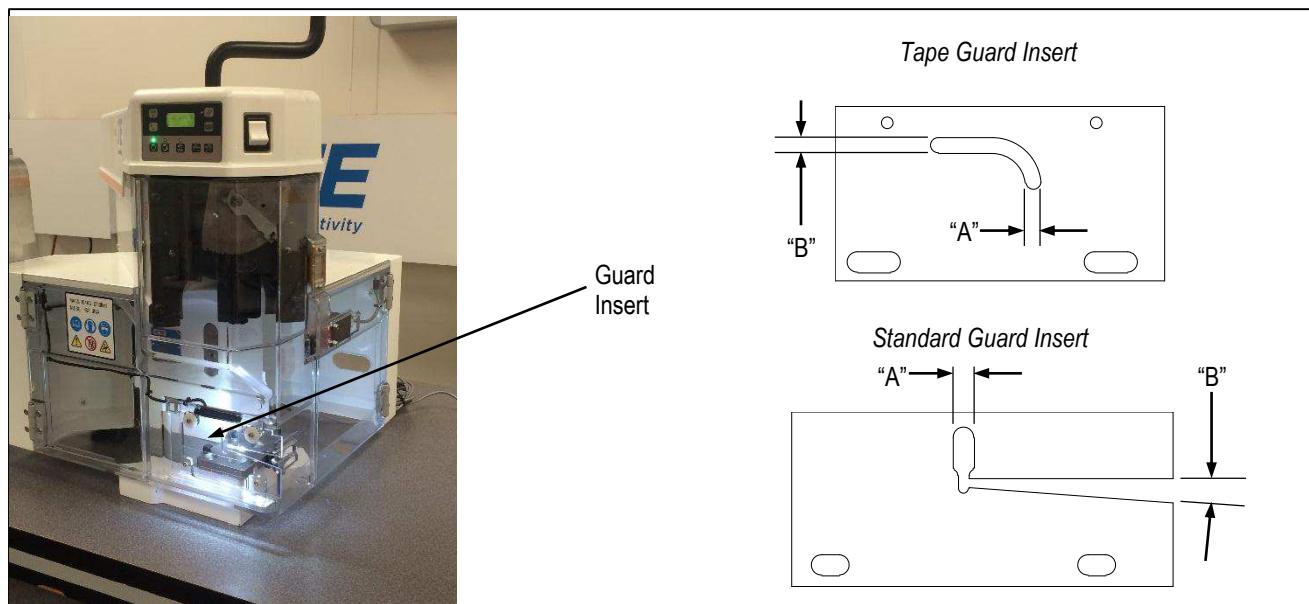


Figure 18

#### A. Guard Inserts of Model G II Terminator (PN 2217000-[ ])

Part Number	Description	Dimension	
		A	B
354529-2	Standard (Away from the Applicator)	7.80 [.307]	6.35 [.250]
1-679532-0	Standard (Close to the Applicator) - Shipped with the Machine	6.22 [.245]	5.08 [.200]
679994-2	Near Tape	6.35 [.250]	6.35 [.250]
679995-2	Away from Tape	8.74 [.344]	6.35 [.250]

Figure 19

#### 1. Standard Guard Insert PN 1-679532-0 and Guard Insert PN 679994-2

- a. Slide the insert into the rear slot of the guard door. Secure the insert to the door with two screws placed through the large square holes in the left guard door and into the threaded holes in the top of the insert. Do not tighten the screws.
- b. Move the insert horizontally and vertically as needed to align the slot with the crimp area of applicator.
- c. Tighten the screws.

2. Guard Insert PN 354529-2 and Guard Insert PN 679995-2
  - a. Slide the insert into the front slot of the guard door. Secure the insert to the door with two screws placed through the large square holes of the insert and into the threaded holes in the bottom of the left guard door. Do not tighten the screws.
  - b. Move the insert horizontally and vertically as needed to align slot with crimp area of the applicator.
  - c. Tighten the screws.

B. Guard Inserts of Model G II+ Terminators (PN 2844800-[ ] and PN 2844810-[ ])

Part Number	Description
2844807-1	Standard (end and side-feed applicators) - Shipped with the Machine
2844808-1	Standard (side-feed applicators with wire seals)
2844817-1	Standard (Ocean style applicators)
2844818-1	Standard (side-feed AMPLIVAR applicators)
2844814-1	Standard (mini-size loose piece applicators)

Figure 20

1. Guard Insert PN 2844807-1, 2844808-1, 2844817-1, 2844818-1, and 2844814-1
  - a. Slide the insert into the rear slot of the guard door. Secure the insert to the door with two screws placed through the large holes in the left guard door and into the threaded holes in the top of the insert. Do not tighten the screws.
  - b. Move the insert horizontally and vertically as needed to align to the crimp area of the applicator.
  - c. Tighten the screws.

## 7. MACHINE OPTIONS AND INSTALLATION OF THE AIR FEED VALVE ASSEMBLY [Figures 21, 22, and 23]

### 7.1. The following machine options are available for the AMP-O-LECTRIC Model G II and G II+ Terminator Machines:

Part Number	Description	Purpose
2217339-1#	Air Feed Valve Kit	Required to run certain air-feed type applicators
354550-3	Lubricator Bowl Assembly	Pre-lubricates the strip
1428156-1	Shoulder Eye Bolt	Provides a lift point for machine installation

# Air Feed Valve Kit is standard on G II+ Terminator Machines PN 2844800-[ ] and 2844820-[ ].

Figure 21

A. To install Air Feed Kit PN 2217339-1, proceed as follows:

**DANGER**

To avoid personal injury, be sure to turn "off" the machine, and disconnect it from the power source.



**NOTE**

For the following procedure, reference Air Feed Kit PN 2217339 Figure 2 "Installation Procedure for Customer Use" included with Air Feed Kit PN 2217339-1.

1. Disconnect power.
2. Remove reel and reel support.
3. Loosen thumbscrews and remove terminal lead-in.
4. Remove four motor guard screws and motor guard.
5. Remove air feed kit guard knockouts - save piece with holes in it.
6. Remove top cover access panel.
7. Remove four recessed screws from top cover.
8. Carefully lift top cover, flip over, and lay on right side guard.

9. Remove four screws from electrical box cover and cover.
10. Mount item 100 (air feed kit) to inside of right side guard with filter going through knockout to exterior of guard.
11. Assemble knockout piece to bottom of right side guard shown using items 103 (screw) and 102 (nut).
12. Cut wire tie holding door interlock wire and using item 104 (wire tie), bundle door interlock wire and item 101 (air feed cable) to right side guard.
13. Route item 101 (air feed cable) through gap in right side guard with door interlock cable.
14. Unscrew indicated cable gland using care not to damage existing wire going through it.
15. Route item 101 (air feed cable) through cable gland into electrical box.
16. Plug item 101 (air feed cable) into connector J17 on pc board.
17. Retighten cable gland securing air feed cable, use care not to over tighten and damage wire.
18. If applicable for assembly, attach items 200 (rear stop) and 201 (screw) to baseplate as shown - remove back left base plate clamp.
19. Reverse procedure to reassemble cover and guards.
20. Install air feed applicator onto baseplate and connect to applicable ports.
21. Make sure slide valve is off - pulled away from filter.
22. For metric air line fittings, remove item 13 (adapter).
23. Attach air supply hose to air valve assembly.
24. To turn air on, slide item 12 (slide valve) towards item 10 (filter). To turn air off, slide item 12 (slide valve) away from item 10 (filter). Make sure item 15 (lockout) is not connected to slide valve.
25. To lock air in off position, turn air off and clamp item 15 (lockout) in location shown. Secure lockout with a lock (customer supplied).

**NOTE**

*The air can be turned "off" by moving the slide valve away from the filter.*

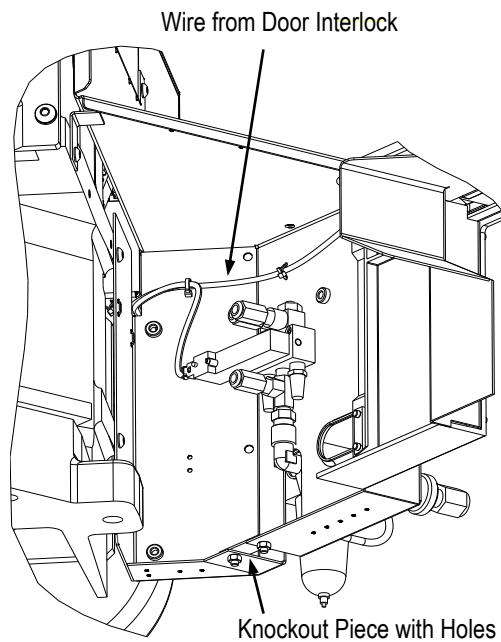


Figure 22

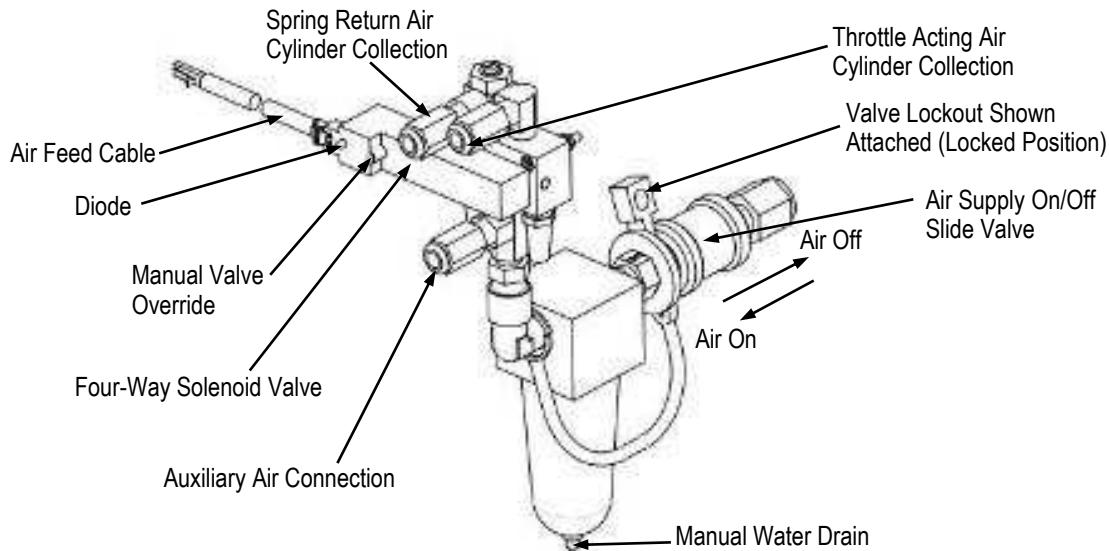


Figure 23

**NOTE**

*The return feed stroke for the two fastest machine speeds occurs 220 milliseconds after the start of the crimp cycle, and, for the four slower machine speeds occurs 440 milliseconds after the start of the crimp cycle*

## 8. TROUBLESHOOTING

Contact the Tooling Assistance Center at 1-800-722-1111.

### 8.1. Error Codes

See Figure 24 for a listing of error codes.

ERROR CODE	ERROR DESCRIPTION
E001	The host is inhibiting operation.
E002	The guard interlock is open.
E003	The insert interlock is open
E004	The safety circuit is not operational.
E005	The control panel is not communicating with the CPU board.
E007	Internal Fault, Safety+24 input detected at the wrong time.
E020	Movement of the TDC switch was not detected.
E021	The TDC switch was not made.
E050	No Modbus Communications with motor drive.
E051	The top interlock is open.
E052	The motor drive indicates the safety circuit is open.
E053	The motor drive indicates it has detected an internal safety fault.
Ennn54	The motor drive indicates it has a fault. nnn represents the fault number. Contact TE engineering for details.
E055	Position switch bad
E056	Braking switch bad
E099	Host Module not detected
E100	Stuck keypad button
E101	Footswitch input stuck on

Figure 24

## 8.2. Diagnostics

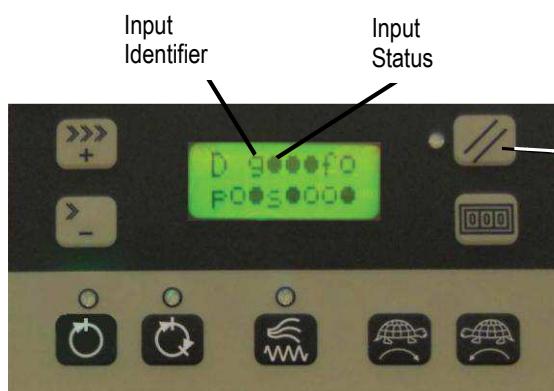
The control panel can be placed in a Diagnostics Mode to check operation of the machine inputs. To place the control panel in the Diagnostics Mode:

1. Press and release Error Reset to clear any error.
2. Press and hold Error Reset for five seconds, until the control panel software version is displayed.
3. Release the Error Reset.

A screen similar to the one in Figure 25 will be presented. Each of the inputs is shown with an input identifier, followed by an input status symbol. The input identifiers are listed in Figure 25 along with corresponding input description. A solid dot indicates the input is "on." A hollow dot indicates the input is "off."

Some identifiers have more than one associated input, and therefore have multiple input status symbols.

Press Error Reset to exit the diagnostic mode.



INPUT IDENTIFIER	INPUT DESCRIPTION
G	Interlocks: Guard, Top, Insert
F	Footswitch
p	Crankshaft Switches: Position, Braking
s	Internal Inputs: Safety +24, Motor Safety Stop, Motor Fault, Motor Not E Safe

Figure 25

## 9. SOFTWARE VERSION IDENTIFICATION

1. Be sure machine is OFF.
2. Turn power to the machine ON.

When the display on the control panel appears, the control panel software version will be displayed briefly, followed by the G II / G II+ software version.

The format for both is: "X.XX.XX."

## 10. DISPOSAL

Contact TE for disposal.

## 11. REPLACEMENT AND REPAIR

See drawing and documentation package to identify parts. Order replacement parts through your TE 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)  
TE CONNECTIVITY CORPORATION  
PO BOX 3608  
HARRISBURG PA 17105-3608

For customer repair service, call 1-800-526-5136.

## 12. RESTRICTION ON HAZARDOUS SUBSTANCES (RoHS) INFORMATION

Information on the presence and location of any substances subject to RoHS can be found at the following website:

<http://www.tycoelectronics.com/customersupport/rohssupportcenter/>

Click on "Find Compliance Status" and enter equipment part number.

## 13. REVISION SUMMARY

This was a major revision. The following AMP-O-LECTRIC terminators were added: Model G II PN 2217001-[ ] and PN 2217002-[ ], and Model G II+ PN 2844800-[ ], PN 2844810-[ ], and PN 2844820-[ ]. This resulted in changes to most sections and all figures.

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