

# customer manual

<b>SAFETY PRECAUTIONS</b> READ THIS FIRST ! .....	2
<b>1. INTRODUCTION</b> .....	3
<b>2. DESCRIPTION</b> .....	4
2.1. Functional Description .....	4
2.2. Electrical Description .....	6
2.3. Machine Guard .....	7
<b>3. RECEIVING INSPECTION AND INSTALLATION</b> .....	8
3.1. Receiving Inspection .....	8
3.2. Installation .....	8
3.3. Considerations Affecting the Placement of Bench Machines .....	9
<b>4. OPERATION</b> .....	10
4.1. Control Panel Operation .....	10
4.2. Applicator Installation .....	10
4.3. Setup .....	13
4.4. Mode Selection and Operation .....	13
4.5. Crimp Height Adjustment .....	15
4.6. End-Feed/Side-Feed Applicator Conversion .....	15
<b>5. PREVENTIVE MAINTENANCE</b> .....	16
5.1. Cleaning .....	16
5.2. Lubrication .....	16
<b>6. ADJUSTMENTS</b> .....	17
6.1. Measuring the Shut Height .....	17
6.2. Shut-Height Adjustment .....	18
6.3. Crimp Height Adjustment Using Precision Adjustment Mechanism (If Equipped) ...	19
6.4. Guard Insert Adjustment .....	20
<b>7. MACHINE OPTIONS AND INSTALLATION</b> .....	22
7.1. Installation of Work Light Assembly Kit 1424264-1 .....	22
7.2. Installation of Work Light Assembly Kit 1424264-1 (Inside the Guard) .....	24
7.3. Installation of Batch Counter Kit 1424267-1 .....	29
7.4. Installation of Air Feed Kit 1424266-1 .....	31
7.5. Installation of Precision Adjustment Kit 1424208-1 .....	33
<b>8. TROUBLESHOOTING</b> .....	33
<b>9. ROHS INFORMATION</b> .....	33
<b>10. REVISION SUMMARY</b> .....	33

ORIGINAL INSTRUCTIONS



## ***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 appropriate ear protection.
- ALWAYS wear approved eye protection when operating powered equipment.
- 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 electrical cord from the power source when performing maintenance on the equipment.
- NEVER wear loose clothing or jewelry that may catch in moving parts of the application equipment.
- NEVER insert hands into installed application equipment.
- NEVER alter, modify, or misuse the application equipment.

## ***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

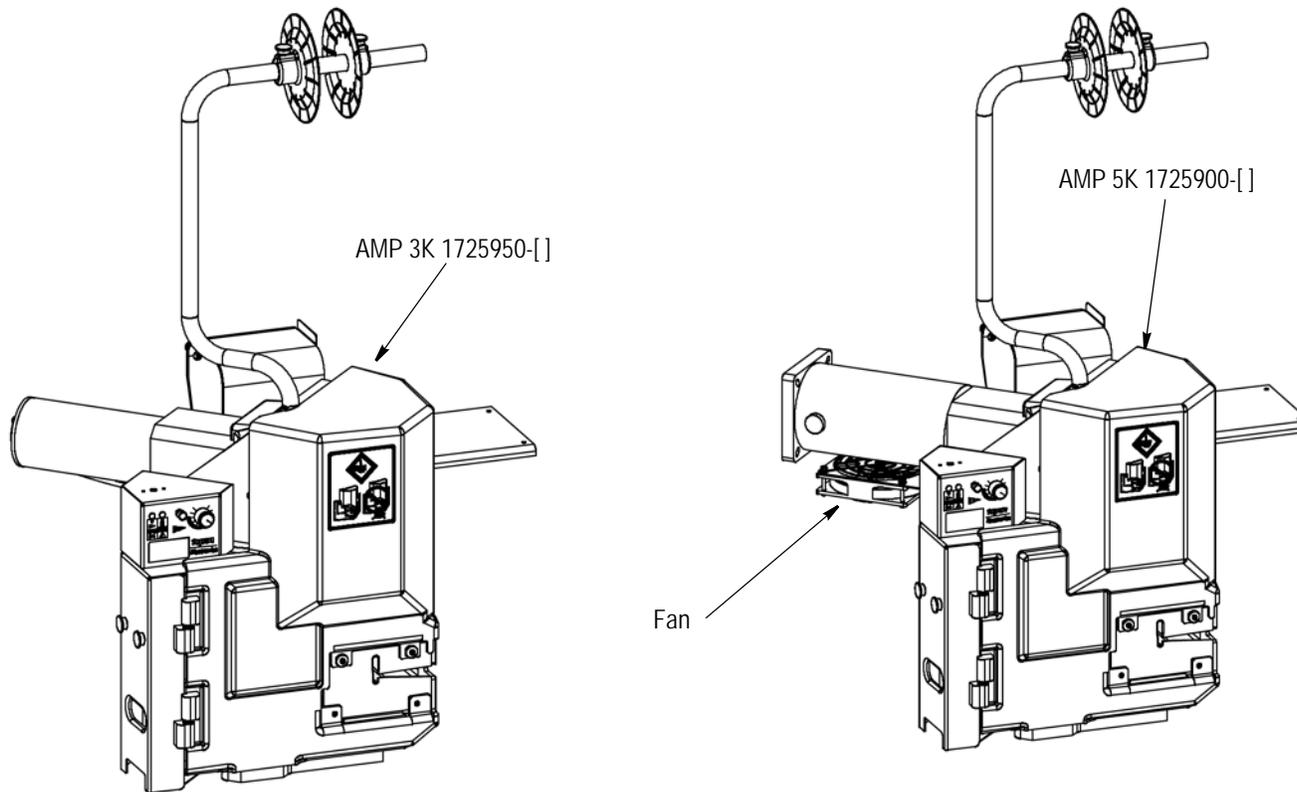


Figure 1

## 1. INTRODUCTION

This manual contains information on operation, preventive maintenance, and adjustments of the AMP 3K and AMP 5K Terminating Machines 1725950-[] and 1725900-[] respectively. See Figure 1.

Both series machines (AMP 3K and AMP 5K) contain separate machines to produce a 30 mm stroke or a 41.28 mm stroke.

Descriptions in this manual pertain to the controls and adjustments on the AMP 3K and AMP 5K machines only.

The specifications and requirements for the AMP 3K and AMP 5K Terminating Machines are as listed below:

<b>Deflection:</b>	0.13 mm [.0046 in.] Maximum per 4,448 Newtons [1,000 lb] Crimp Force
<b>Noise (Model 3K Series):</b>	Less than 76 dBa Typical at operator position with standard mechanical feed applicator
<b>Noise (Model 5K Series):</b>	Less than 80 dBa Typical at operator position with standard mechanical feed applicator
<b>Weight:</b>	68.86 Kilograms [143 lb]
<b>Height:</b>	510 mm [20 in.] without reel supports
<b>Electrical:</b>	100-240 Vac, 50/60 Hz, Single-Phase Current
<b>Air:</b>	620-760 kPa [90-100 psi], 2.83 liters/sec (6 scfm) When required for use with air-feed applicators
<b>Physical Environment:</b>	Temperature: 4.4°-40° C [40°-104° F] Relative Humidity: Less than 95% (non-condensing) Transportation and Storage: Store in a clean, dry environment after coating all surfaces lightly with a rust preventing oil.

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.

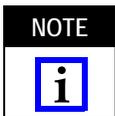
When reading this manual, pay particular attention to **DANGER**, **CAUTION**, and **NOTE** statements.



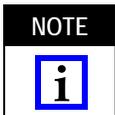
*Denotes an imminent hazard which may result in moderate or severe injury.*



*Denotes a condition which may result in product or equipment damage.*



*Highlights special or important information.*



*Dimensions in this manual are in metric units [with U.S. customary units in brackets].*

## 2. DESCRIPTION

The AMP 3K/40 and AMP 5K/40 Terminating Machines were designed to be used as stand-alone semi-automatic bench units. They are assembled with metric hardware.

These machines accept a wide variety of miniature (mini) quick-change applicators, with minor adjustments, thus providing a great selection of terminals for many applications. Figure 2 lists changeover cams required to run 1 1/8-in. stroke cams (for AMP-O-ELECTRIC\* Model "K" terminating machines) and 1 5/8-in. stroke cams (for Model "T" and Model "G" Terminating machines) in the machines.

ORIGINAL APPLICATOR	FEED TYPE	CHANGEOVER CAMS FOR THE MACHINES	
		1 5/8-in. [41.25mm] Stroke Machines	1 1/8 -in [30mm] Stroke Machines
1 1/8-in. Stroke Applicator for Model "K" Terminating Machine	Pre-Feed	690602-6	---
	Post-Feed	690501-4	---
1 5/8-in. Stroke Applicator for Model "T" and Model "G" Terminating Machines	Pre-Feed	---	690602-5
	Post-Feed	---	690501-3
Heavy-Duty Industrial (HD-I) Applicator	Pre-Feed/ Post-Feed	Refer to the HD-I Applicator customer drawing for part numbers.	

Figure 2

### 2.1. Functional Description

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 a dc motor which drives a crankshaft. The motor is activated each cycle and rotates the crankshaft one full revolution. A motor access cover, located on the end of the motor, covers a hex key which allows the motor to be cycled manually. See Figure 3.
2. The **crankshaft-ram group** covers the motor rotational force to the up-and-down action of the ram for driving the applicator during the crimping cycle.

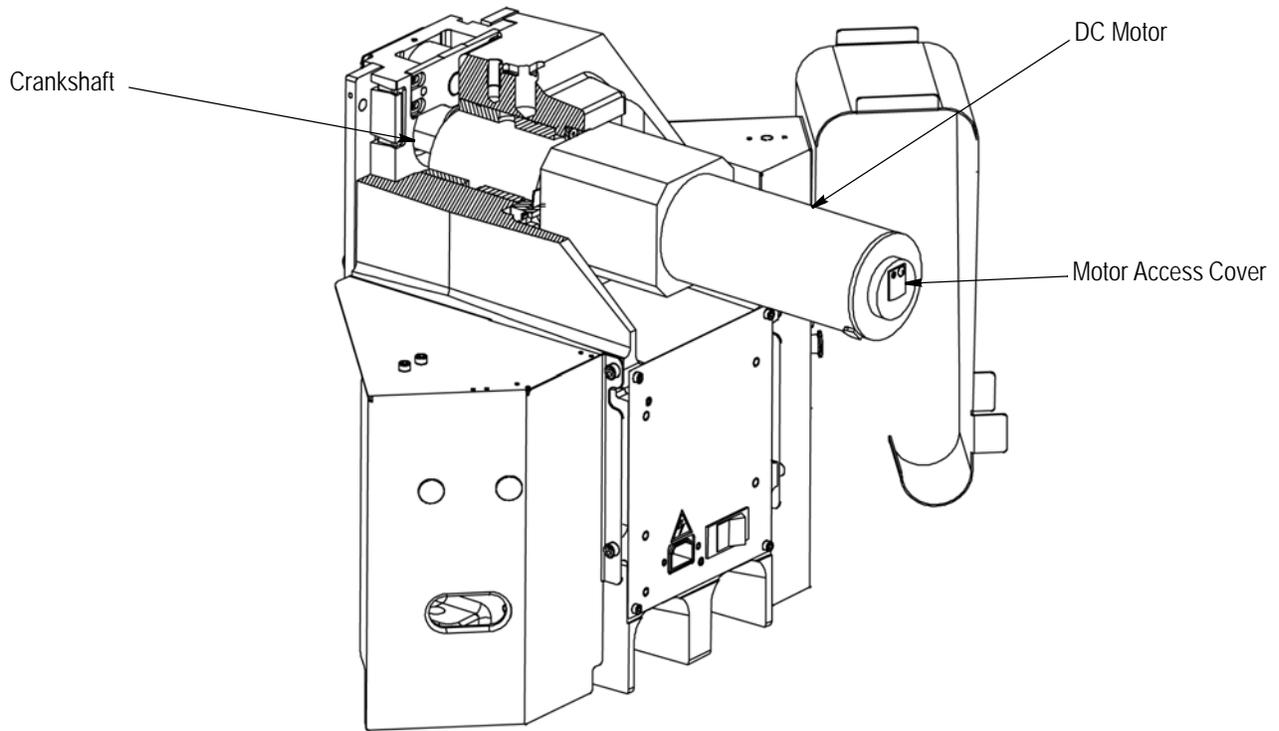


Figure 3

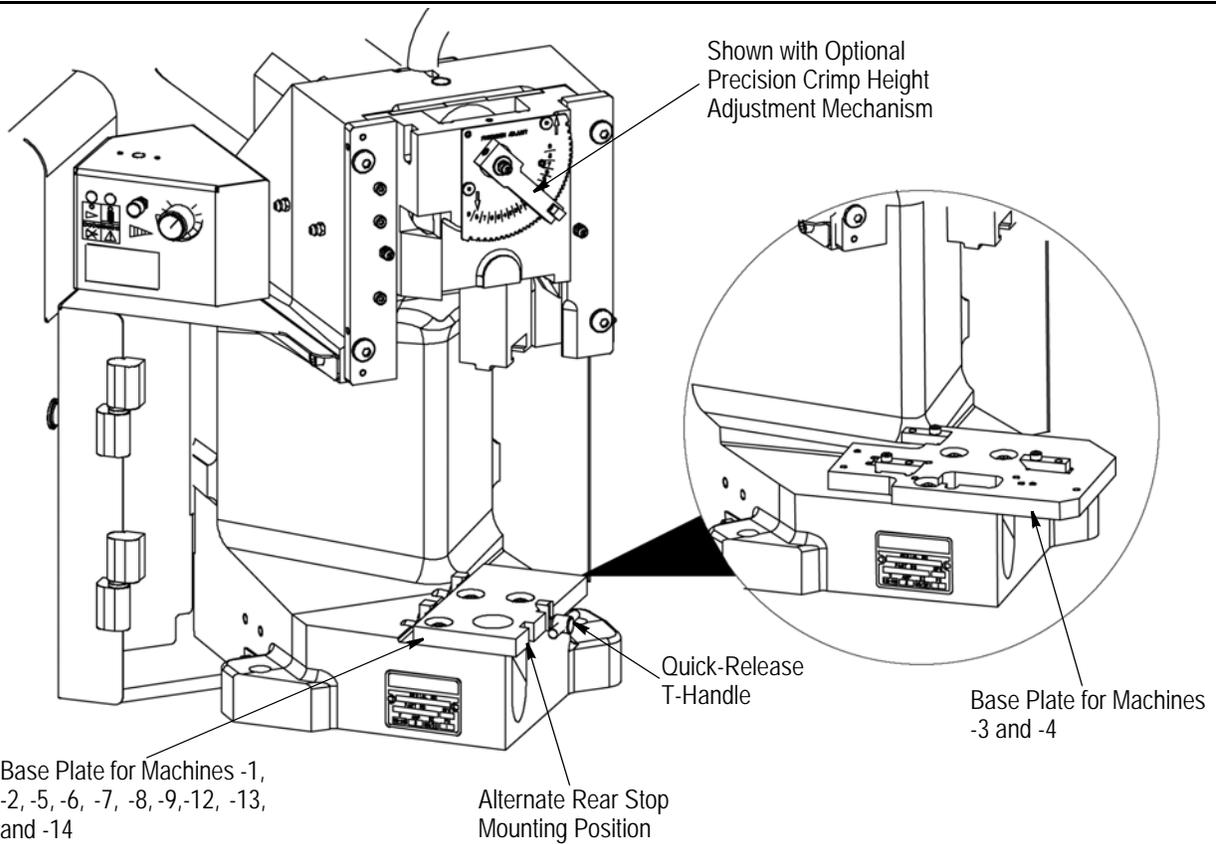


Figure 4

3. The base plate provides the mounting surface on which the applicator is installed. The quick-release latching feature on Machines -1, -2, and -5, through -13 permit fast, easy installation and removal of the applicator. Note that Machines -3 and -4, restricted to Asia/Pacific market, do not include the quick-release latching feature. See Figure 4.

## 2.2. Electrical Description

The 1725950-[ ] and 1725900-[ ] machine electrical components consist of the operator control panel, the motor, and the CPU/motor controller package. The machine operates 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 AMP 5K Terminating Machine CPU/motor controller packages contain a fan to cool the motor assembly. (See Figure 1.) This fan runs whenever the main power switch is on.

The operator control panel (Figure 5) is mounted on the left side of the machine frame. The control panel consists of two indicator lights, one jog button, and one speed control knob, with icons depicting each function. See Paragraph 4.1 for control panel operation.

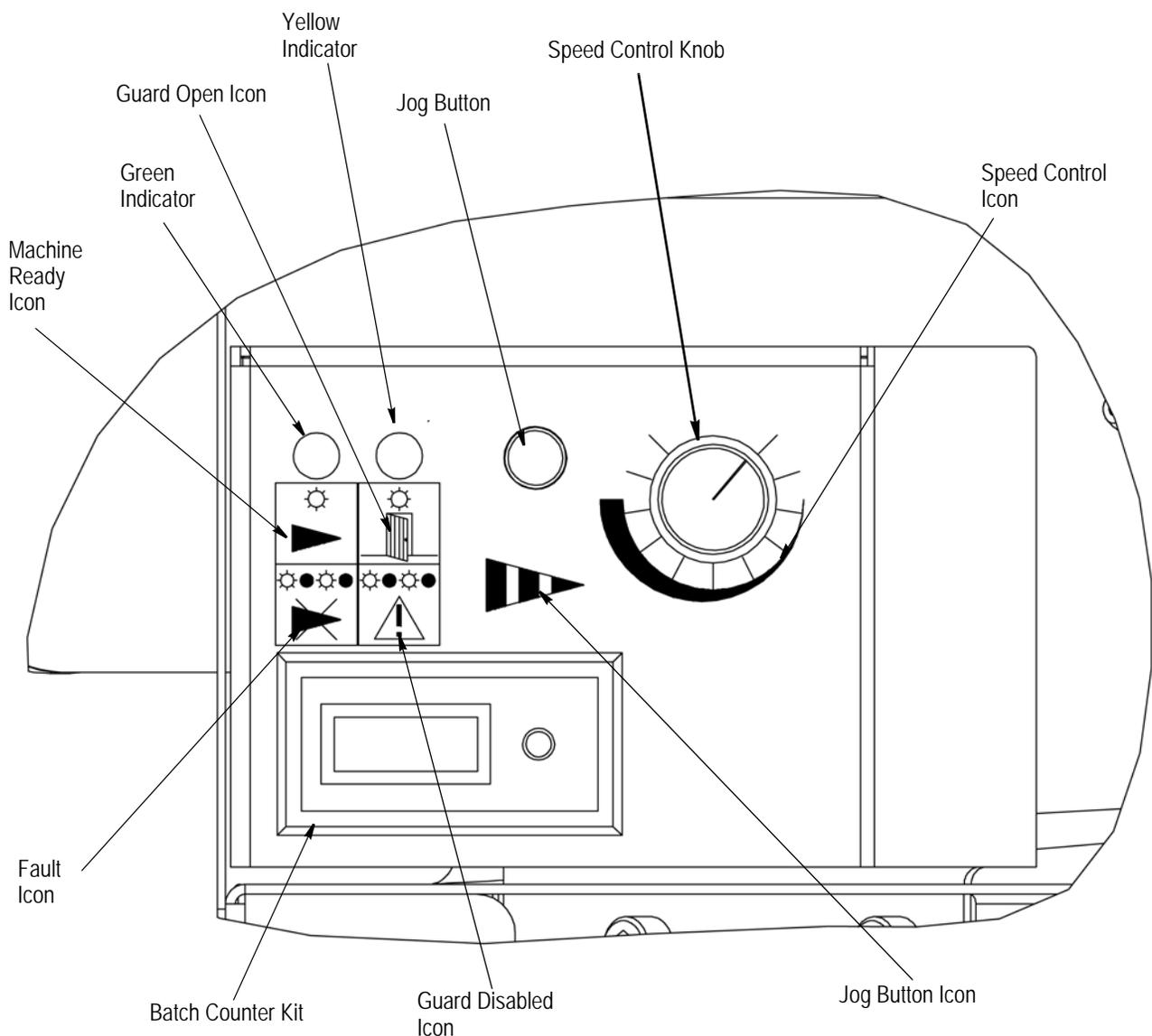


Figure 5

A main power switch/circuit breaker (Figure 6) is located on the back of the machine. This switch connects ac power to the control system. The CPU/motor controller is located behind the back cover of the machine. It is a modular unit that contains all of the electronics necessary to operate the machine. See Figure 6.

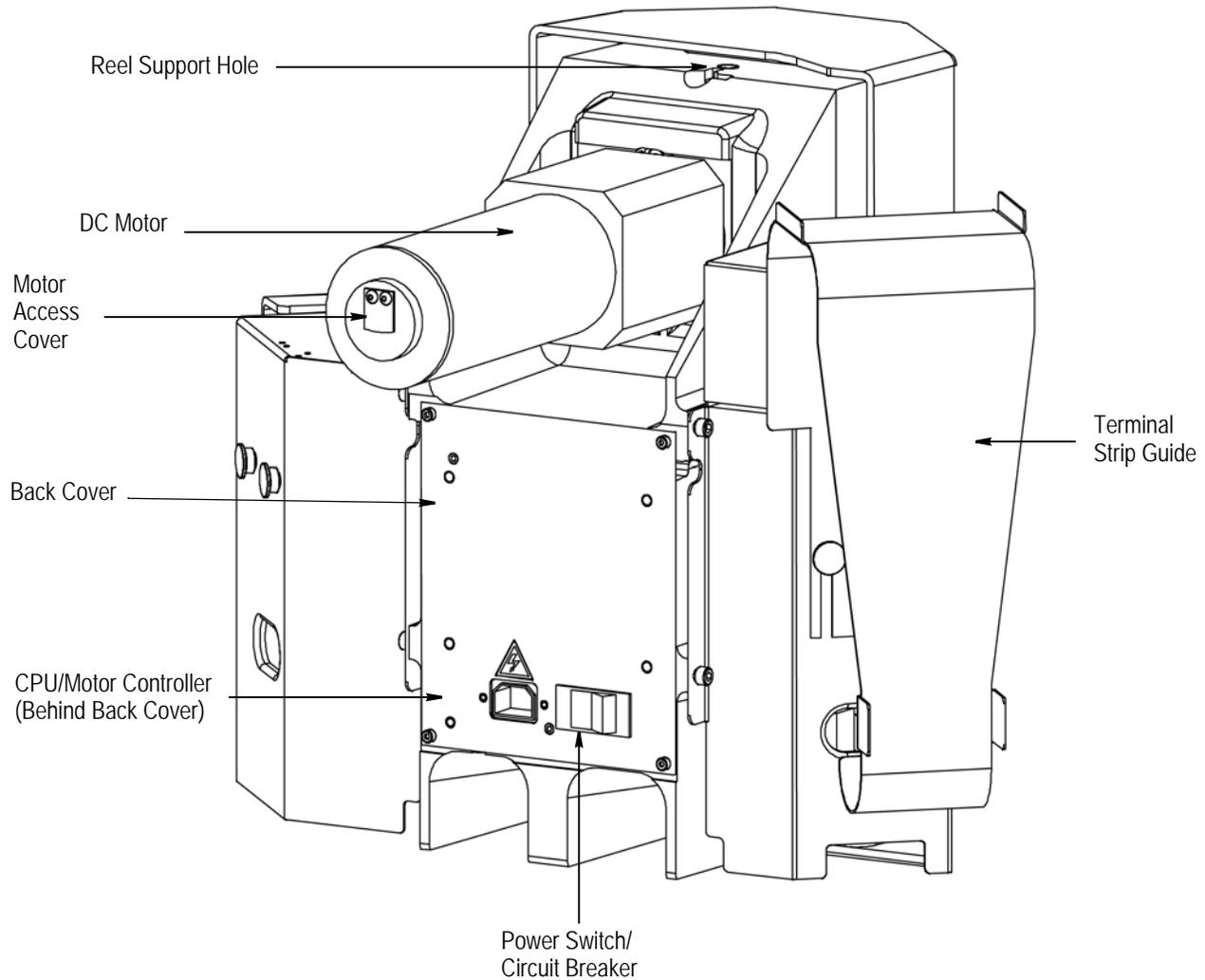


Figure 6

### 2.3. Machine Guard (Figure 7)

A 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 interlock on the guard prevents the machine from cycling if the guard door is open during production operation.



*Machines -4, -8, -11, and -13 do not include the safety interlock feature. To avoid personal injury, remember that the power is not automatically shut off when the guard doors are opened.*

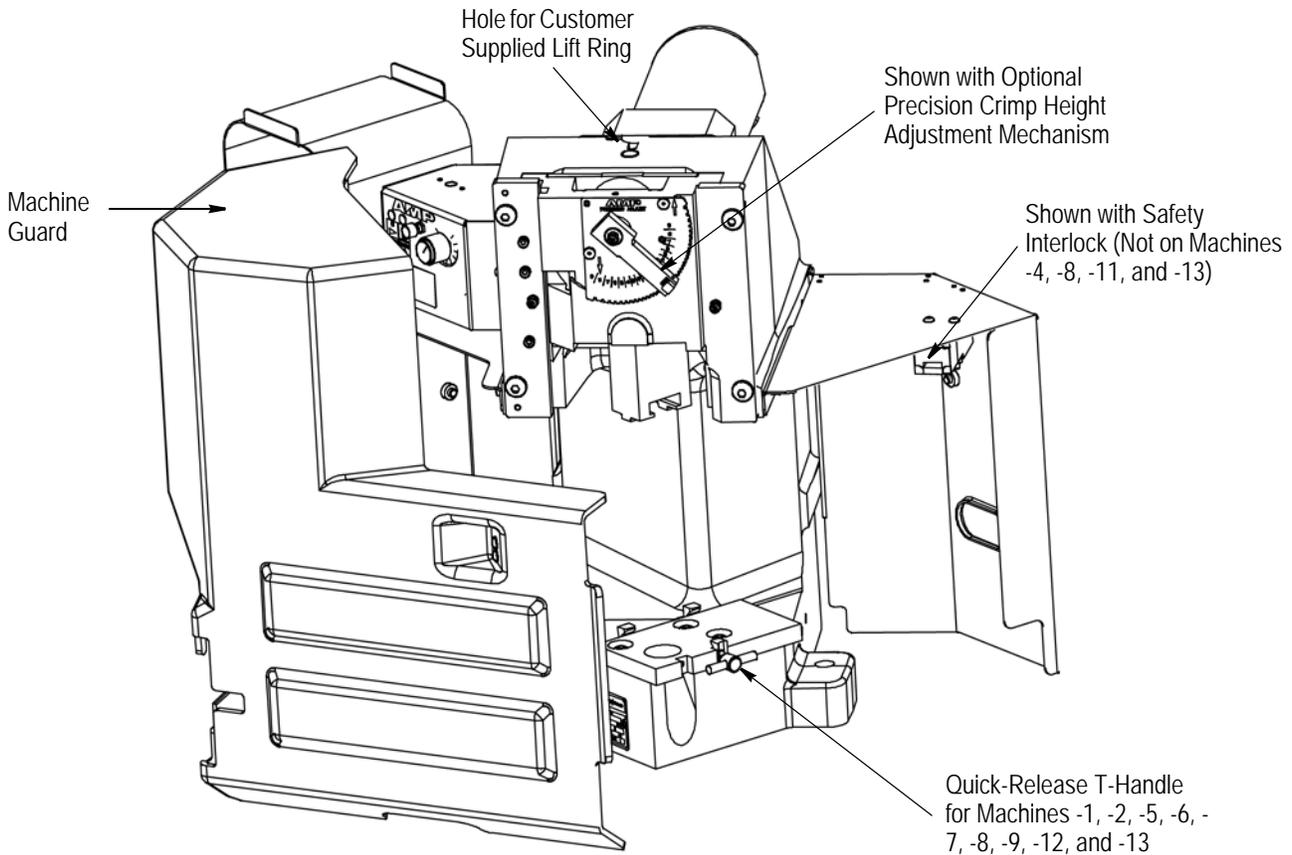


Figure 7

### 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. Install lift ring (see Figure 7) on top of the machine.

**NOTE** *Lift ring (M1220 eye bolt) is customer supplied.*



**NOTE** *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 (Figure 6) until the roll pin engages a groove in the machine frame.

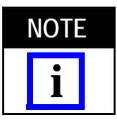
Attach the terminal strip guide included with the machine with the two thumbscrews supplied. Mount the guide on the left guard for side-feed applicators. Mount the guide on the right guard for end-feed applicators.

Connect the power cord to a suitable electrical supply.

**NOTE** *The machine will automatically detect the supply voltage and adjust the controller accordingly.*



**NOTE** *Machines exported to Europe will be installed by TE service engineers. These engineers will verify that the electrical and pneumatic connections are correct. Both pneumatic and electrical connections must be installed in a way that provides a lockable isolation switch for hard-wired or direct piped machines. This is necessary to interrupt power to the machine for setup or maintenance.*



### 3.3. Considerations Affecting Placement of Bench Machines

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 8 illustrates proper machine location and operator position and the following:

#### A. Bench

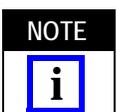
The bench to be used should be of sturdy construction, preferably with rubber mounts to minimize noise. A height of 762 to 812.8 mm [30 to 32 in.] is the most suitable for operator comfort and convenience. This height allows the operator to rest both feet on the floor, thereby providing for the shifting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

#### B. Machine 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.] 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).

**NOTE** *Machines have provisions for being bolted to the bench.*



#### C. Operator's Chair

The operator's chair should swivel, and should 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 that the operator's back is straight and is 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.

**Machine Location and Operator Position**



**Materials Locations—Plan View**

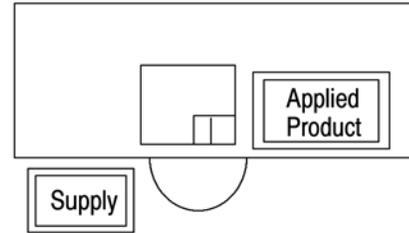


Figure 8

**E. Scrap Removal**

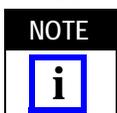
A suggested method of scrap removal: place a tray on the right side of the machine, under the cast slot in the frame, to capture the scrap chips.

**4. OPERATION**

**4.1. Control Panel Operation**

The basic control panel operation is as described in Figure 9. The control panel will be used to set up and operate the machine (see Paragraphs 4.3 and 4.4).

**4.2. Applicator Installation**

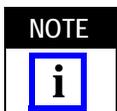


*These instructions apply to Machines -1, -2, -5, -6, -7, -8, -9, -12, and -13.. Since Machines -3 and -4 do not contain a quick-release feature, they do not contain a quick-change mounting base plate. The appropriate additional baseplate tooling will be required on Machines -3 and -4. The -10 and -11 machines use a swing handle to release applicators. Installation is in the reverse order of removal.*

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



*If the machine is equipped with a precision adjustment feature, 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.*



*Applicators from AMP-O-ELECTRIC Model "K" terminating machine and Model "T" terminating machine can be used in these machines by using a special replacement cam. Refer to Figure 2.*

1. Loosen the quick-release T-handle (see Figure 5) 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.

- 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-ELECTRIC 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 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.
- If the applicator is an air-feed type, connect the airlines to the valves located on the back of the machine.

**NOTE**

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

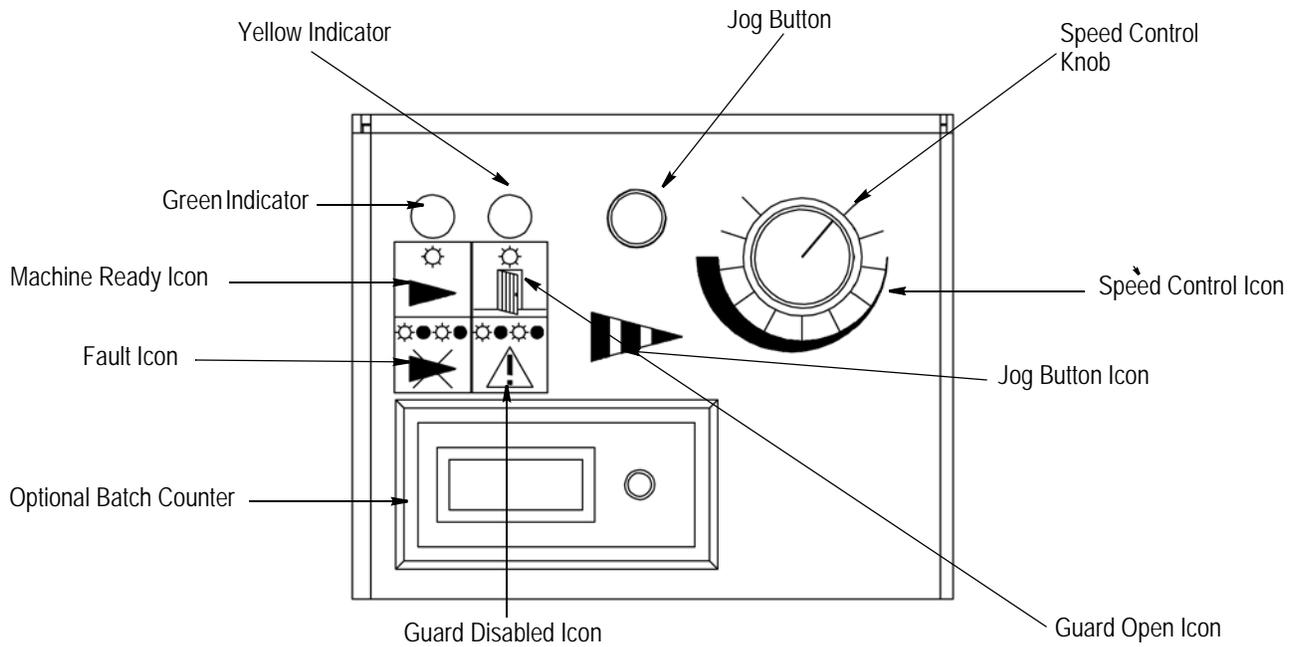
- Adjust the reel support for side-feed or end-feed product, depending on the applicator being used.
- Mount the terminal strip guide on the left sheet metal guard for side-feed product, or on the right sheet metal guard for end-feed product, depending on the applicator being used.
- Mount the terminal reel on the reel support. Thread the terminal strip through the guard and into the applicator according to the instruction sheet included with the applicator. If necessary, adjust the lubricator bowl.
- Align the product reel to the applicator by adjusting the reel flanges.
- Close the guard.

**NOTE**

*The guard door must be closed in order to operate the machine, unless you are in the Jog (With Guards Disabled) Mode. See Paragraph 4.4.C.*

**DANGER**

*Opening the guard door will not disable Machine-4, -8, -11, and -13.*



The green indicator on the top of the control panel indicates the machine status.



When the green indicator is “on” and is **not** flashing, the machine is ready for operation.



When the green indicator is flashing, a machine fault has been detected. (To reset the machine, “power down” the machine, clear the problem area, and then “power up” the machine. Or hold down the foot pedal until the green indicator stops flashing.)



The yellow indicator on the top of the control panel indicates the guard status. (Note that this indicator is not active on the -4, -8, -11, and -13 machines).



When the yellow indicator is on and is **not** flashing, the guard is open and the machine will not run.



When the yellow indicator is flashing, the guard is disabled and the machine will only operate with the Jog button.



The Jog button allows the operator to cycle through various stages of the machine cycle.



The Jog button icon indicates intermittent operation at a slower speed when using the Jog button.



The Speed Control Knob determines the machine speed (active in both normal operation and Jog operation) Speed increases as the knob is turned **CLOCKWISE**.

Speed Ranges:

- From 100% to 60% with the foot pedal
- From 60% to 25% with the Jog button

Figure 9

### 4.3. Setup

Install a miniature applicator and terminals according to Paragraph 4.1.

1. Turn on the main power using the switch located on the back of the machine.
2. Jog the machine (as described in Paragraph 4.3, B) through a complete crimp cycle.



*Machine should be able to jog through the terminal and wire at maximum jog speed to determine crimp capacity.*

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

### 4.4. Mode Selection and Operation

The three basic modes of operation for these machines include: Full-Cycle, Jog, and Jog (With Guards Disabled).

#### A. Full-Cycle Mode

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

#### B. Jog Mode (Figure 9)

Pressing the Jog button causes the crankshaft to be rotated at a default-reduced speed in the forward 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 direction at the default reduced speed. If the machine does not complete the cycle, either adjust the speed control knob (as described below), or complete the cycle using the footswitch (at a speed determined by the speed control knob) after the Jog button has been pressed and released.

Holding the Jog button down for more than five seconds will cause the machine to "err." To clear the error, "power down" the machine, clear the problem area, and then "power up" the machine again. An alternate method of clearing the error is to hold down the foot pedal until the green status indicator stops flashing. 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.



*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 manually cycle the machine to the home position. Manually cycle the machine by removing the access cover on the end of the motor (Figure 6), engaging the hex key with a 6-mm hex wrench, and rotating the key to manually rotate the motor.*



*To avoid personal injury, be sure to remove the hex wrench before operating the machine under power. Be sure to replace the access cover.*



*To avoid personal injury, exercise caution when jogging or operating the -4, -8, -11, and -13 machines. These machines will jog/cycle with the guards in the open or closed position.*

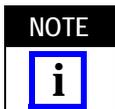
## Adjusting the Speed Control Knob

The default speed of the crankshaft in the Jog Mode is set to a minimum initial value which is not defined by the initial position of the speed control knob. Adjusting the speed upwards enables jogging at speeds greater than the default in case greater speeds are required to complete a cycle. To cause the crankshaft to rotate at other than the initial default speed, the speed control knob must be rotated completely counterclockwise, then rotated back clockwise to the desired speed setting. If the Jog button is depressed within three seconds of setting the speed control knob, the crankshaft will rotate at the speed defined by the position of the speed control knob. The new speed setting will remain active for a maximum of three seconds after the Jog button is released, or until the crankshaft completes the cycle. If the cycle is not complete and the Jog button is again pressed within three seconds from its release, the crankshaft will rotate at the speed defined by the position of the speed control knob. Failure to push the Jog button within the three seconds of its release will cause the crankshaft jog speed to revert back to the initial minimum default value. After the Jog button is released, the speed control knob can be rotated in either direction to increase or reduce the crankshaft jog speed, but Jog button must be activated again within three seconds of the release or the speed will revert back to minimum default speed. The speed control knob can be reset as many times as desired.

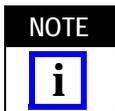


*The ram may drift downward if the Jog button is released in mid-stroke.*

### C. Jog (With Guards Disabled) Mode (Figure 9)



*Since the -4, -8, -11, and -13 machines do not employ safety interlock switches in the guard doors, this section does not apply to them.*



*The foot pedal will NOT initiate cycling in this mode.*



*To avoid personal injury, be very careful of moving mechanisms when jogging the machine with the guards open.*

This mode allows maintenance and setup personnel to slowly rotate the crankshaft with the guard door open. To activate this mode, turn "off" power, and open the guard door. Turn the power back "on" and, immediately after the machine ready and guard disable indicators flash "on", press and hold the Jog button. The guard disable indicator will flash at a rate of two flashes per second, indicating that the guard has been disabled. Pressing the Jog button will rotate the crankshaft at a reduced rate until the Jog button is released or the crankshaft completes one cycle.

Pressing the Jog button causes the crankshaft to be rotated at a default-reduced speed in the forward direction until the Jog button is released or the crankshaft completes the cycle. If the Jog button is released in mid-cycle and then pressed again, the crankshaft will continue to rotate in the forward direction at the default reduced speed. If the machine does not complete the cycle, see "Adjusting the Speed Control Knob," below.

Holding the Jog button for more than five seconds and not completing the cycle may cause the machine to "err." To clear the error, "power down" the machine, clear the problem area, and then "power up" the machine. Another method of clearing an error is to hold down the foot pedal until the green status indicator stops flashing. If the motor is stalled, it may be necessary to manually cycle the machine to the home position. See the CAUTION and DANGER statements above for manual cycling.

## Adjusting the Speed Control Knob

The default speed of the crankshaft in the Jog Mode is set to a minimum initial value which is not defined by the initial position of the speed control knob. Adjusting the speed upwards enables jogging at speeds greater than the default in case greater speeds are required to complete a cycle. To cause the crankshaft to rotate at other than the initial default speed, the speed control knob must be rotated completely counterclockwise, then

rotated back clockwise to the desired speed setting. If the Jog button is depressed within three seconds of setting the speed control knob, the crankshaft will rotate at the speed defined by the position of the speed control knob. The new speed setting will remain active for a maximum of three seconds after the Jog button is released, or until the crankshaft completes the cycle. If the cycle is not complete and the Jog button is again pressed within three seconds from its release, the crankshaft will rotate at the speed defined by the position of the speed control knob. Failure to push the Jog button within the three seconds of its release will cause the crankshaft jog speed to revert back to the initial minimum default value. After the Jog button is released, the speed control knob can be rotated in either direction to increase or reduce the crankshaft jog speed, but Jog button must be activated again within three seconds of the release or the speed will revert back to minimum default speed. The speed control knob can be reset as many times as desired.

The machine will exit the Jog (With Guards Disabled) Mode whenever the guards are closed or the power is turned "off."



*The speed control knob in Figure 9 also adjusts the air feed timing. Normally the air feed timing is set at 280 ms. When the speed control is set at less than 50% of its maximum setting (pointing straight down or counterclockwise from pointing straight down), the air feed timing changes to 440 ms. This is done to accommodate applicators that have longer than normal air cylinders.*

The green flashing status indicator flashes a specific number of times to represent a corresponding fault. For example, the green status indicator will flash two times (each followed by a one second pause) to indicate that the machine guard opened while the machine was running. Refer to Figure 10.

FAULT INDICATOR CODE (Number of Consecutive Flashes)	MACHINE FAULT
2	The guard opened while the motor was running.
3	The guard must be closed before proceeding.
4	Motion from top dead center (TDC) was not detected.
5	The TDC switch was not sensed.
6	A bad PWM IGBT was detected.
7	A bad Jog push button input was detected.
8	A bad footswitch input was detected.
9	A bad DC bus relay was detected.
10	A bad jog enable input was detected.
11	The line voltage is not within specifications.
12	A bad spare input was detected.

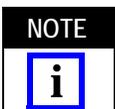
Figure 10

#### 4.5. Crimp Height Adjustment

On machines that do not include the precision adjustment feature, the crimp height must be adjusted at the applicator. Refer to the instructions provided with the applicator to perform this adjustment. Refer to Paragraph 6.3 for procedures to adjust the crimp height using the machine precision adjustment feature.

#### 4.6. 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.



*Lubricator Bowl Assembly 354550-1 is an optional accessory.*

## 5. PREVENTIVE MAINTENANCE

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



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

### 5.1. Cleaning

Clean any debris from the applicator area daily.



*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.



*DO NOT USE ANY SOLVENT TO CLEAN THE GUARDS. Solvent could damage the guards.*

### 5.2. Lubrication

The moving parts of the machine require regular lubrication to ensure reliable service and long life. Use only a good grade NLGI No. 2 grease.



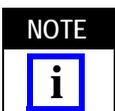
*Contact TE engineering for preferred lubricants.*



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

Using a grease gun, apply grease every 250,000 cycles to the fittings at the following locations and as shown in Figure 11:

- 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 at two places; and



*Give one pump of grease while the ram is near the top of its stroke and one pump of grease while the ram is near the bottom of its stroke for best distribution of grease around the bearing.*

- the crimp height adjuster pivot pin.

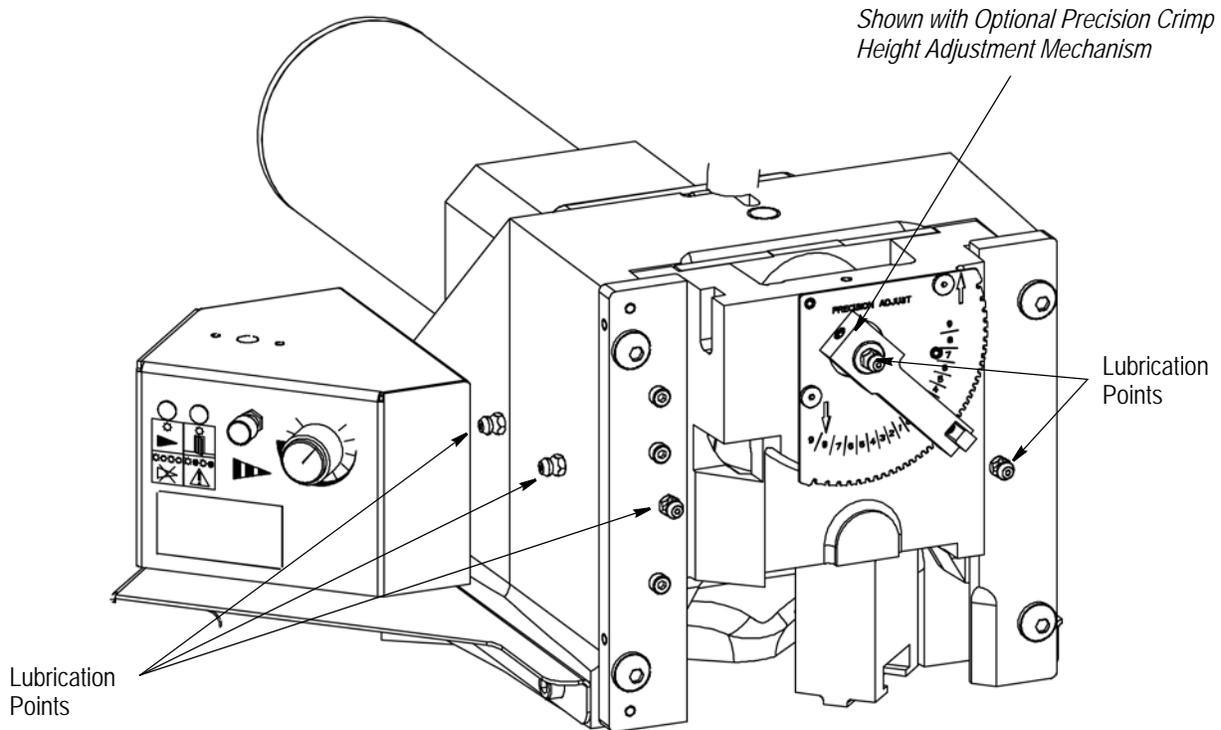


Figure 11

## 6. ADJUSTMENTS

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



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

### 6.1. Measuring the Shut Height

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 12.

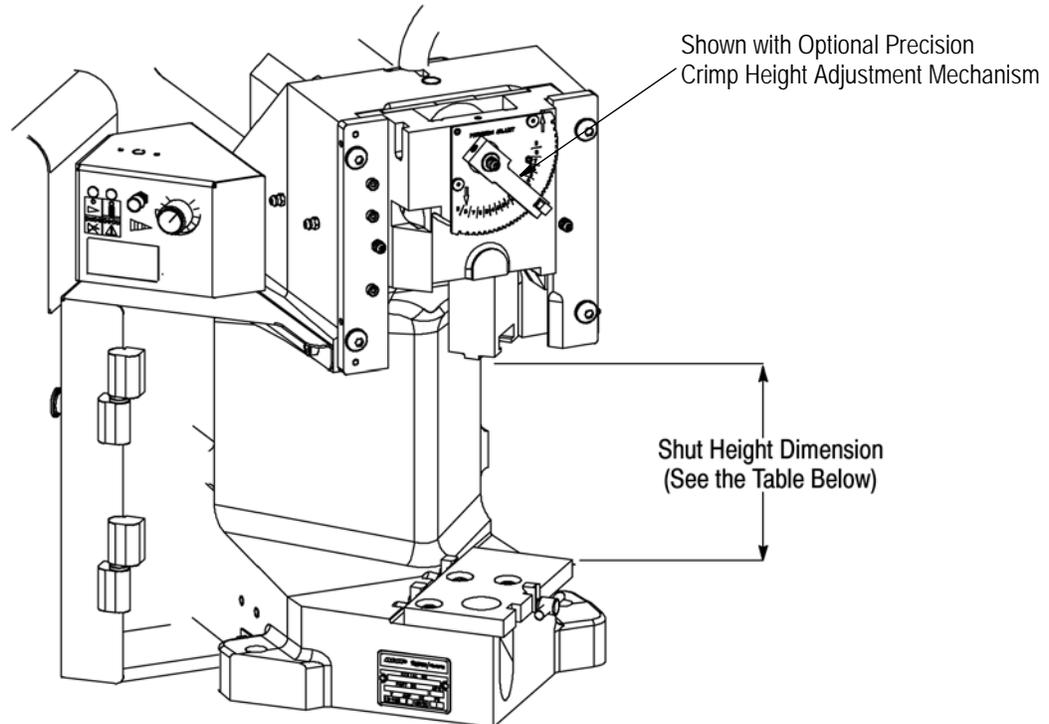


*Shut Height Gage 679655-[] (see the table in Figure 12) is recommended for measuring shut height (refer to 408-8535 for instructions on use of the gage).*

1. .If installed, adjust the manual precision adjustment lever to the "0" setting.
2. Remove the access cover (Figure 6) on the end of the motor.
3. Insert a 6-mm hex wrench into the end of the motor until it completely engages the hex key in the end of the motor. Use the hex wrench to manually rotate the motor.



*Be sure to remove the hex wrench before operating the machine.*



SHUT HEIGHT GAGE PART NUMBER	MACHINE PART NUMBERS (91725950-[ ] and 1725900-[ ])	SHUT HEIGHT DIMENSIONS	APPLICATOR TYPE
679655-2	-1 Through -9, -12, and -13	135.79 mm +/- 0.025 mm [5.346 +/- .0010 In.]	AMP
679655-3	-10, -11, and -14	119.50 +/- 0.025 mm [4.7047 +/- .0010 In.]	JAM

Figure 12

4. Follow the procedure for measuring the shut height as described in 408-8535.
5. Install the access cover onto the end of the motor.

## 6.2. Shut-Height 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, refer to Figure 13, and 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.



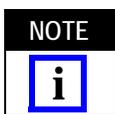
*If additional shims are required, they can be ordered using the numbers 1338618-1 (for 41.25 mm stroke machines) or 1424680-1 (for 30 mm stroke machines).*

- 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.



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

### 6.3. Crimp Height Adjustment Using Precision Adjustment Mechanism (If Equipped)



*The precision adjustment mechanism is available on most machines, with the exception of -1 and -5 machines; as well as Field Retrofit Kit 1424208-1 for Machines -1 and -5.*



*To avoid damaging the applicator, ALWAYS return the precision adjustment lever to the "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 4.1.
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:
  - a. to the right to increase the crimp height; or
  - b. to the left to decrease the crimp height.



*Moving the precision adjustment lever in either direction will change the crimp height by approximately 0.013 mm [.0005 in.] per step.*

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



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

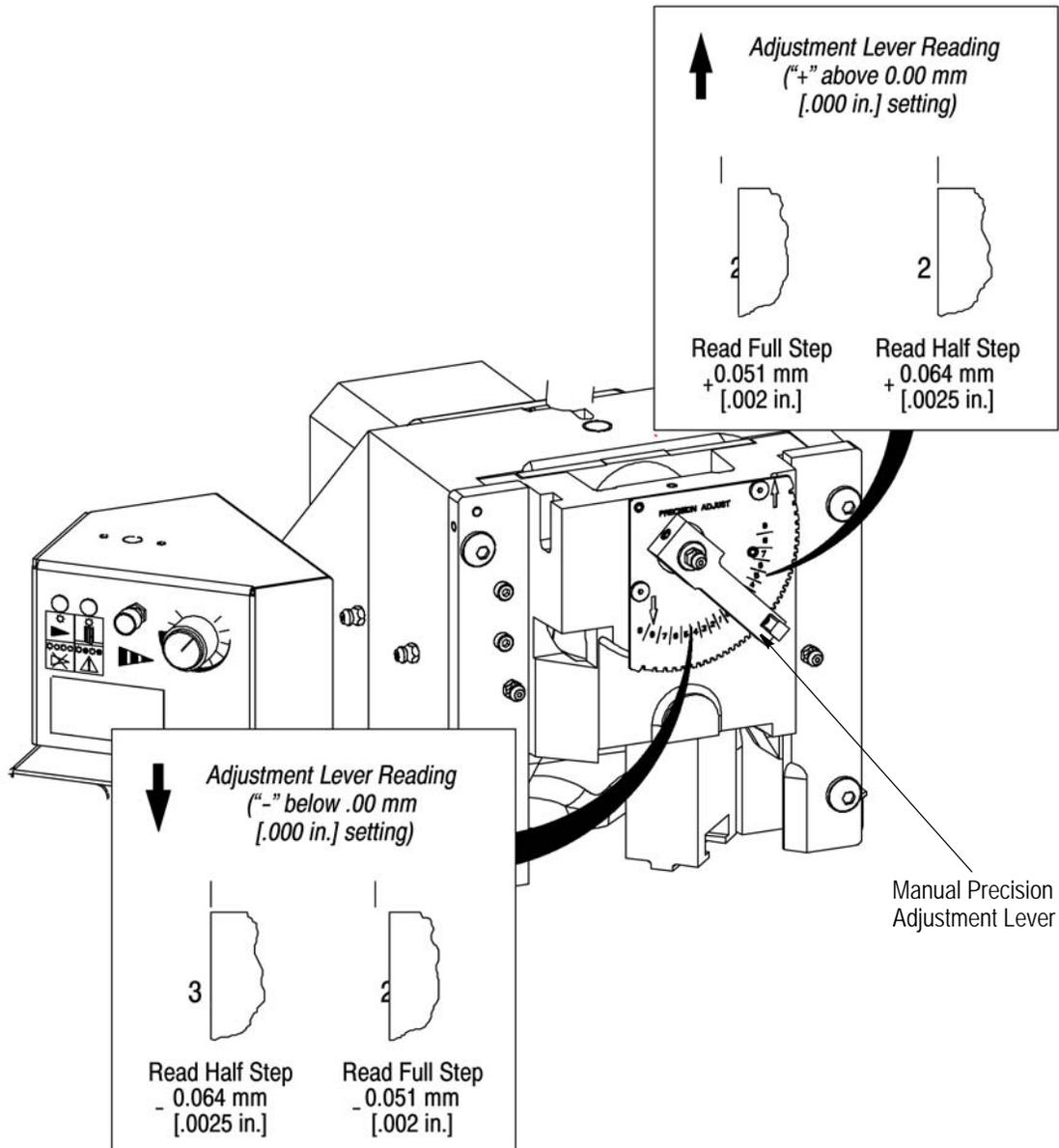


Figure 13

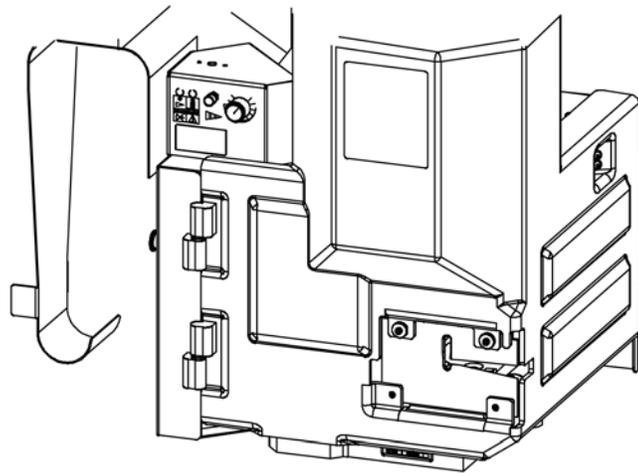
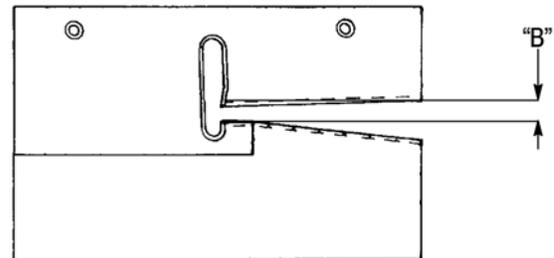
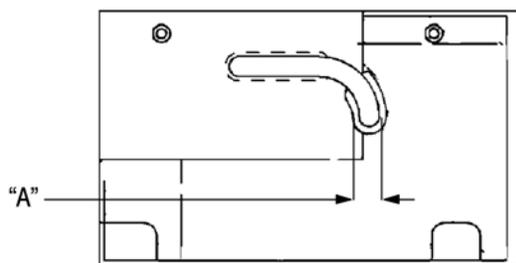
#### 6.4. Guard Insert Adjustment

A guard insert is supplied with the machine. Some applications may require a special insert. See Figure 14 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.



*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 according to the instructions for the standard insert.*


**Tape Guard Insert**
**Standard Guard Insert**


GUARD INSERT		DIMENSION	
PART NUMBER	DESCRIPTION	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 14

**A. Standard Guard Insert 1-679532-0 and Guard Insert 679994-2**

1. 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.
2. Move the insert horizontally and vertically as needed to align the slot with the crimp area of applicator.
3. Tighten the screws.

**B. Guard Insert 354529-2 and Guard Insert 679995-2**

1. 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.
2. Move the insert horizontally and vertically as needed to align slot with crimp area of the applicator.
3. Tighten the screws.

## 7. MACHINE OPTIONS AND INSTALLATION

The following machine options are available for the AMP 3K and AMP 5K machines:

PART NUMBER	DESCRIPTION	PURPOSE
1424264-1	Work Light Kit (64111 Osram/Sylvania)	Provides lighting to the work area
1424266-1	Air Feed Valve Kit with 40-mm [15/8-in.] Stroke	Required to run 40-mm [15/8-in.] stroke applicators
1424266-2	Air Feed Valve Kit with 30-mm [11/8-in.] Stroke	Required to run 30-mm [11/8-in.] stroke applicators
1424267-1	Batch Counter Kit	Counts terminations
1424208-1	Precision Adjust Field Retrofit Kit	Allows 0.0127-mm [.0005-in.] adjustments
354550-3	Lubricator Bowl Assembly	Pre-lubricates the strip
1424265-1	CQM Adapter Kit and Sensors	Required to add CQM to these machines (CQM Interface Kit 1320431-4 and CQM 1320420-2 are <i>not</i> included in this kit)
1320431-4	CQM Interface Kit	Required to connect the CQM to the machines
1320420-2	CQM	Monitors crimp height
1428156-1	Shoulder Eye Bolt	Provides a lift point for machine installation

In addition to the previously listed options, the following machine options are available only for Machines -3 and -4:

JAM Applicator Mounting Kit 1424268-1

JST Applicator Mounting Kit 1424269-1

### 7.1. Installation of Work Light Assembly Kit 1424264-1



*To avoid personal injury, be sure to turn "off" the machines and disconnect them from the power source.*

1. Open the clear guard on the machine to gain access to the two socket head screws securing the user interface to the frame.
2. Remove the two socket head cap screws securing the user interface to the frame. Carefully lift the user interface assembly to clear the sheet metal guard.



*Use caution when removing the interface so that the wiring harness to the interface is not damaged.*

3. If equipped with Batch Counter Kit 1424267-1, depress the tabs on the side of the batch counter within the user interface assembly and pull the batch counter out of the enclosure.



*Do not pull or damage the wiring harness to the batch counter*

4. Disconnect the user interface assembly wiring harness connector from the printed circuit (pc) board inside the user interface assembly.
5. Remove the three work light kit knockout holes (Figure 15, Detail A) from the top of the user interface assembly.



*When removing the knockouts, be careful to not damage the pc board inside the assembly.*

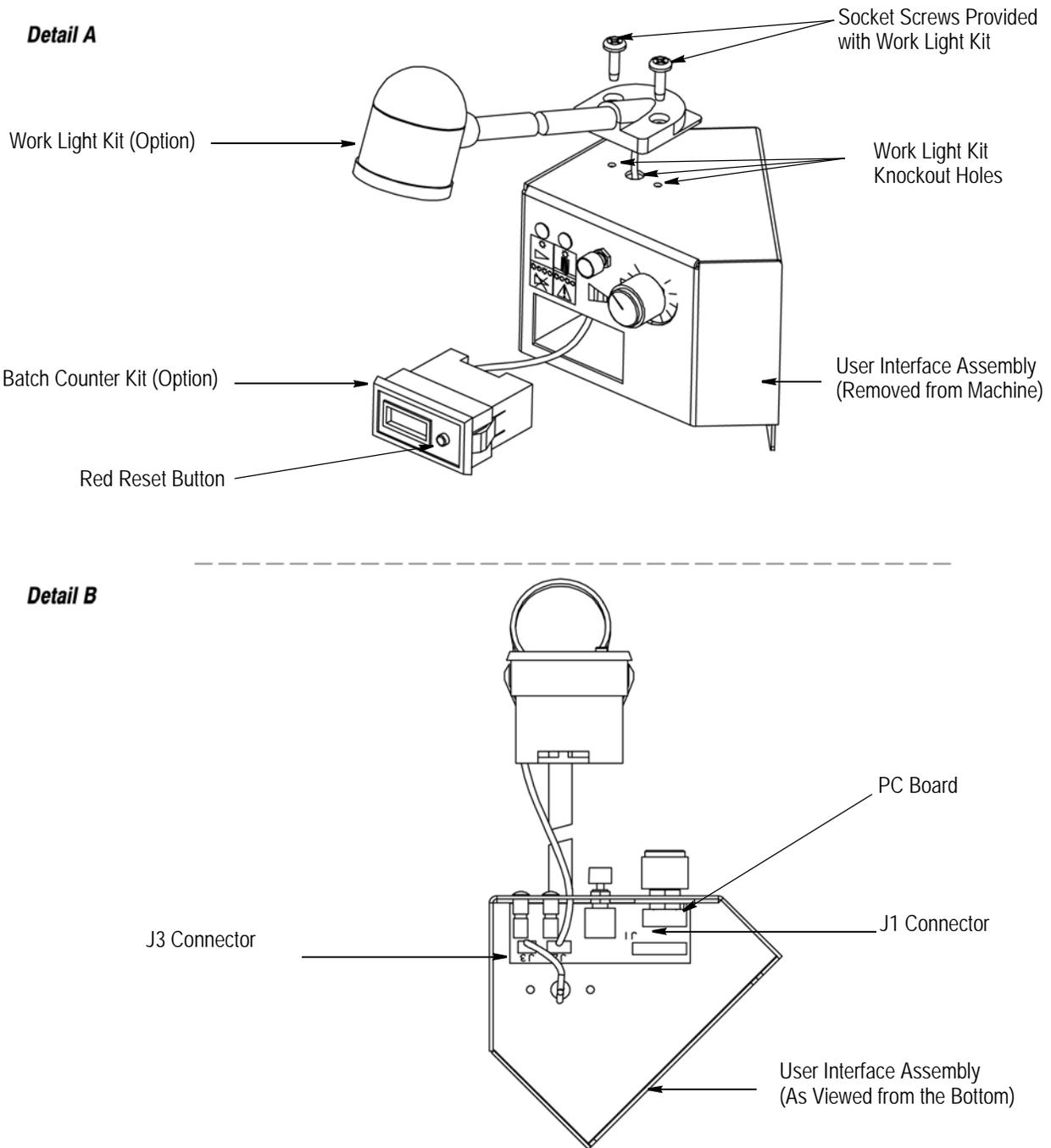


Figure 15

6. Insert connector end of lighting kit wire into the center knock out hole.
7. Plug the lighting kit connector into the J3 connector on the pc board inside the user interface assembly. See Figure 15, Detail B.
8. Attach the light (as shown in Figure 15, Detail A) to the top of the user interface enclosure using the socket screws provided.
9. If equipped with Batch Counter Kit 1424267-1, insert the batch counter kit into the appropriate knockout opening until it snaps into place. The red reset button should be on the right-hand side.

10. Re-attach the connector from the machine wiring harness to the J1 connector on the pc board in the interface assembly.

11. Install the user interface assembly into the frame and secure using the two socket head screws.



*Be sure the interface assembly wiring harness is not pinched or kinked.*

12. Close the clear guard on the machine.

13. Connect the machine to the power source and turn the machine "on."

## 7.2. Installation of Work Light Assembly Kit 1424264-1 (Inside the Guard)

Typically, when this assembly is mounted, it is mounted outside the guard. (See Figure 16.) This procedure allows you to install the work light kit inside the guard.

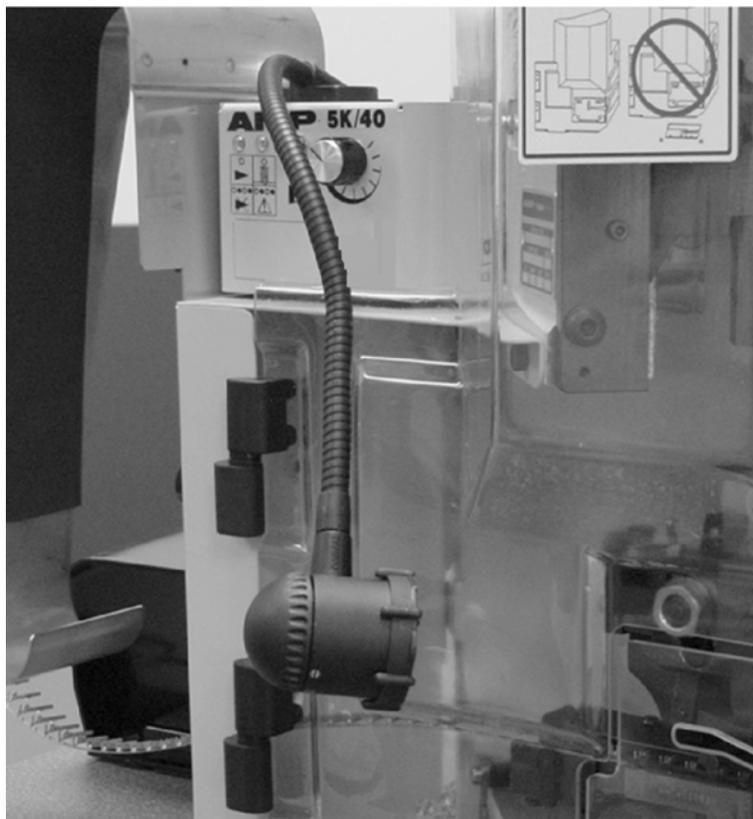


Figure 16



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



*Figure 17*

1. Align the marks on the head of the work light as shown in Figure 17. This allows the top of the work light to be disassembled.
2. Remove the cap as shown in Figure 18.



*Figure 18*

3. Using a screwdriver, begin prying the retaining clip out of the light assembly. See Figure 19.



*Figure 19*

4. Finish removing the retaining clip from the light assembly and remove the light assembly from the "goose neck." Refer to Figure 20.



*Figure 20*

5. Thread the "goose neck" through the hole in the cover. Refer to Figure 21.



Figure 21

6. Install the light assembly to the end of the "goose neck."
7. Install the retaining clip in the light assembly. Refer to Figure 22.



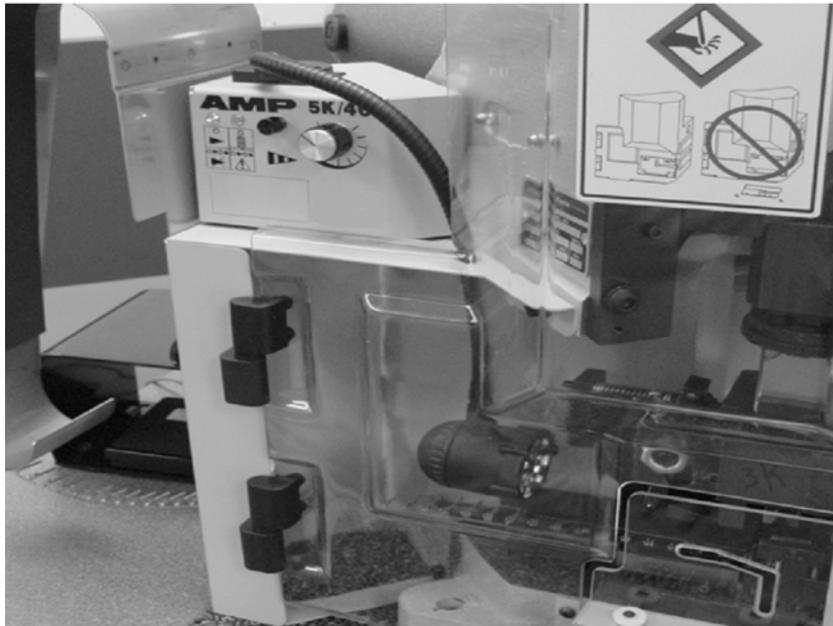
Figure 22

8. Replace the cap on the light assembly and align the marks as shown in Figure 23. Turn the cap clockwise (as viewed from the top) to tighten the work light assembly.



*Figure 23*

After closing the guard door, the finished work light assembly should appear as shown in Figure 24.



*Figure 24*

### 7.3. Installation of Batch Counter Kit 1424267-1

**DANGER**

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



1. Open the clear guard on the machine to gain access to the two socket head screws securing the user interface to the frame.
2. Remove the two socket head cap screws securing the user interface to the frame. Carefully lift the user interface assembly to clear the sheet metal guard.

**CAUTION**

*Use caution when removing the interface so that the wiring harness to the interface is not damaged.*



3. Disconnect the wiring harness connector from the pc board inside the user interface assembly.
4. Remove the batch counter kit knockout from the front of the user interface assembly.

**CAUTION**

*Do not damage the pc board inside the interface assembly when removing knockout.*



- a. If equipped with PC Board 1338974-1, remove the buttons and two hex nuts securing the board into the user interface assembly.
  - b. Remove and replace the board with Operator Interface Board Assembly 1490444-1.
  - c. Re-assemble hex nuts to secure the board assembly in the user interface assembly.
  - d. Re-assemble the small push button.
  - e. Position and tighten the locking screw of the larger dial button on the shaft of the switch so that when the dial is rotated fully counterclockwise, the indicator on the dial is aligned with the indicator on the silk screen as shown in Figure 26.
5. Insert the connector end of the batch counter wire through the knockout opening.
  6. Plug the batch counter connector into the J2 connector on the user interface assembly pc board. See Figure 25.
  7. Insert the batch counter kit into the knockout opening until it snaps into place. The red reset button should be on the right-hand side.
  8. Attach the connector from the machine wiring harness to the J1 connector on the user interface assembly pc board.
  9. Install the user interface assembly into the frame and secure using the two socket head screws.

**CAUTION**

*Be sure the interface assembly wiring harness is not pinched or kinked.*



10. Close the clear guard on the machine.
11. Connect the machine to the power source and turn the machine "on."

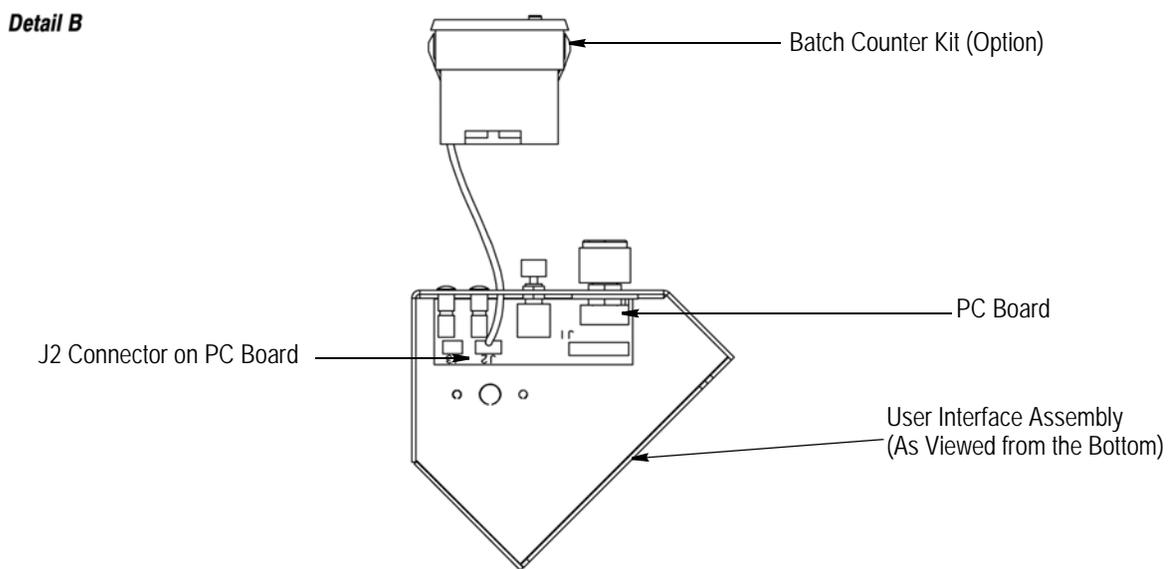
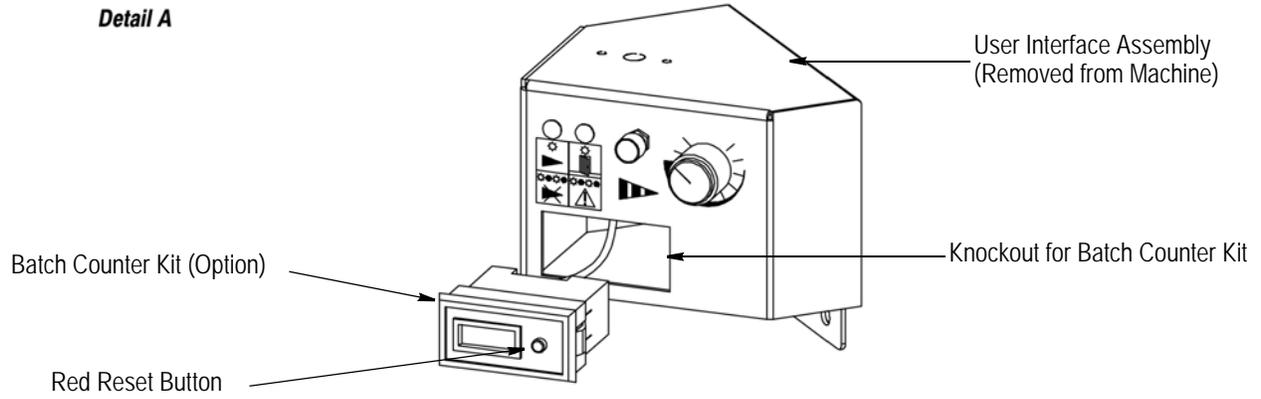


Figure 25

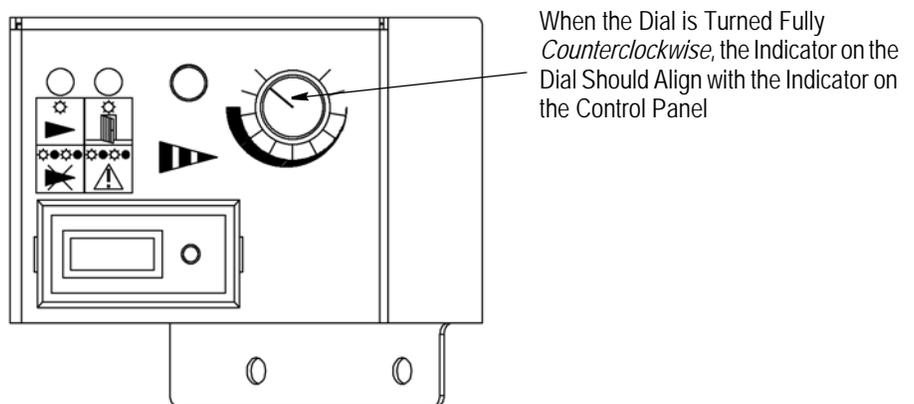


Figure 26

### 7.4. Installation of Air Feed Kit 1424266-1



*To avoid personal injury, be sure to turn "off" the machines, and disconnect them from the power source.*



*Some applications require the installation of an Oversized Guard Kit 1976900-1. These applications are primarily ones that use two inch stroke air-feed cylinders.*

1. Remove the four bolts securing the rear controller panel to the frame. Refer to Figure 27.
2. Remove the control panel from the machine and pivot it in order to view the control board.
3. Insert the small end of the air feed cable assembly (see Customer Drawing 1424266) into the J7 socket. See Detail in Figure 27.
4. Install the control panel into the machine with the air feed cable assembly through the upper right hand slot in the machine frame. See Figure 27.

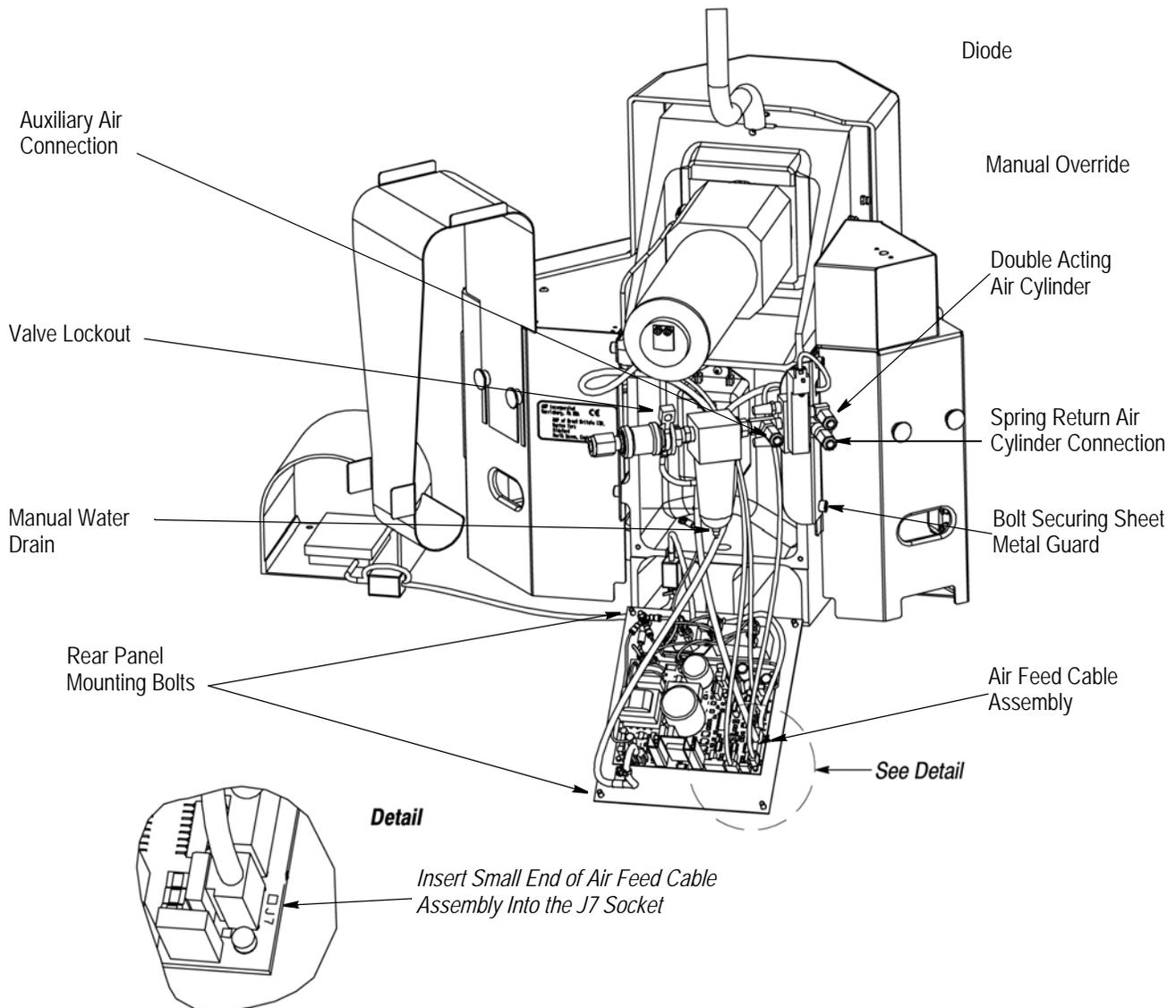


Figure 27

5. Remove the two bolts securing the rear of the left sheet metal guard. See Figure 27.
6. Install Air Feed Bracket 1338977-1 to the frame (see Figure 28) using the two bolts securing the sheet metal guard (Figure 27).
7. Prepare the baseplate assembly as follows:
  - a. For Air Feed Kit 1424266-1 (standard machine base plate), install the socket head screw and rear stop to the baseplate as shown in Figure 29. Then remove the back left baseplate clamp.
  - b. For Air Feed Kit 1424266-2 (universal machine base plate), install the socket head cap screw (as shown in Figure 30) and Air Feed Clamp 1338963-1. Then remove the back left baseplate clamp.
8. Install the air feed applicator onto the baseplate.

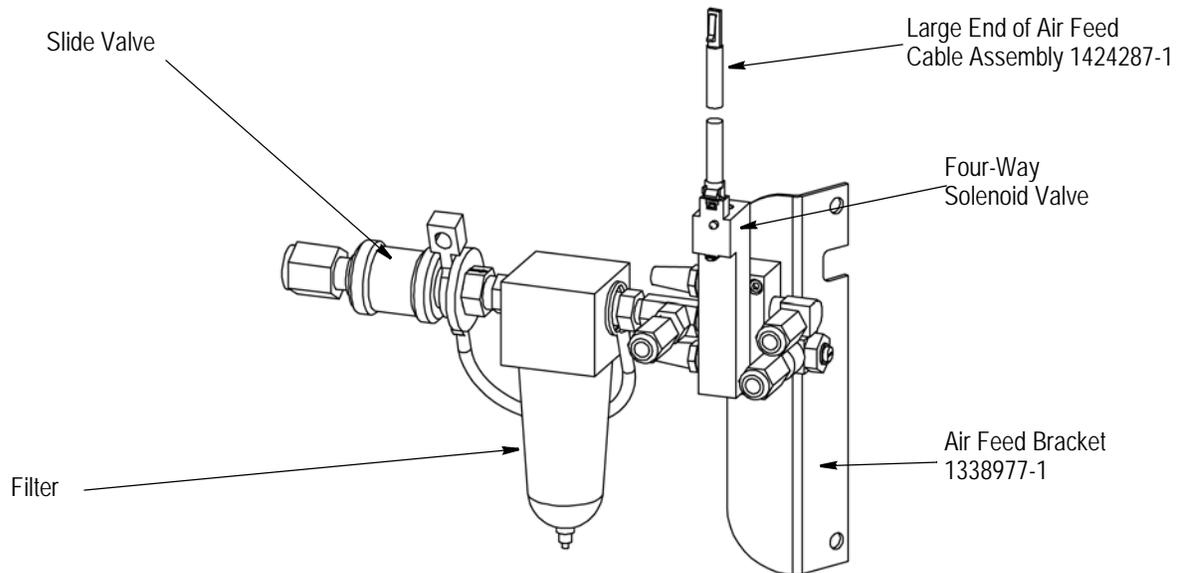


Figure 28

9. Connect the air lines to the applicable ports, as shown in Figure 27.
10. Turn the air "on" by moving the slide valve (Figure 28) toward the filter.

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

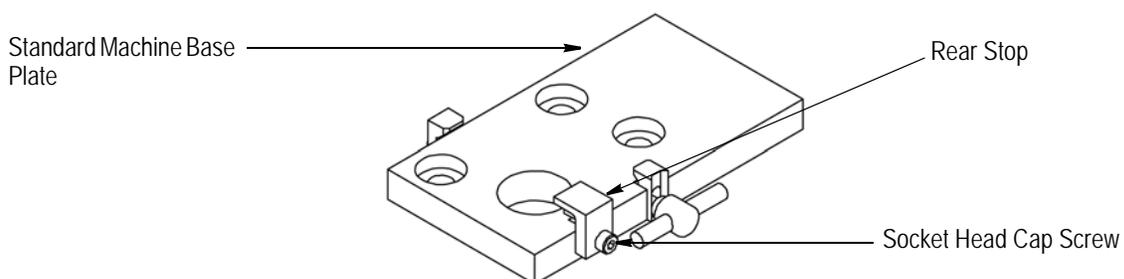


Figure 29

11. Lock the air in the "off" position. Turn the air "off" and clamp the valve lockout in position as shown in Figure 27.

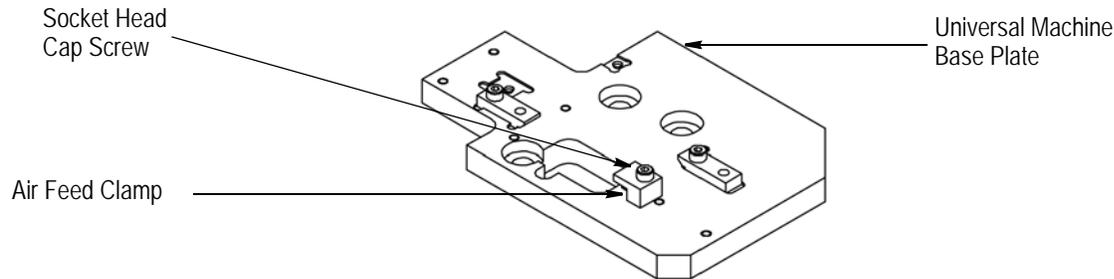


Figure 30

### 7.5. Installation of Precision Adjustment Kit 1424208-1

Refer to Customer Drawing 1424208, and install the optional precision adjustment kit as follows:



*To avoid personal injury, electrical and pneumatic power must be DISCONNECTED at the source prior to precision adjust kit installation.*

1. Disconnect power to the machine.
2. Remove grease fitting from non-eccentric pin.
3. Remove two double setscrews from the top of the ram that retains the eccentric pin.
4. Pull the non-eccentric pin and replace with Eccentric Pin 354510-1.
5. Drive two slotted spring pins (PN 21920-5) into ram housing and attach indexing plate with two socket head cap screws (PN 992285-1).
6. Assemble Adjust Lever 1320363-1 and install onto eccentric pin. Apply a thread-locking substance to the threads, and tighten the setscrew.
7. Install the grease fitting (removed in Step 2) onto Eccentric Pin 354510-1. Lubricate the pin.
8. Adjust the shut height and crimp height as described in Paragraphs 6.2 and 6.3.

### 8. TROUBLESHOOTING

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

### 9. RoHS INFORMATION

Information on the presence and location of any substances subject to RoHS (Restriction on Hazardous Substances) can be found at the following website:

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

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

### 10. REVISION SUMMARY

Revisions to this customer manual include:

- Changed the company name and logo.