

customer manual

SAFETY PRECAUTIONS READ THIS FIRST ! 2

1. INTRODUCTION 3

2. DESCRIPTION 4

2.1. Functional 4

2.2. Electrical 4

3. RECEIVING INSPECTION AND INSTALLATION 7

3.1. Receiving Inspection 7

3.2. General Installation 7

3.3. Installing Terminating Machines 122754-1 and -2 into Komax Model 40 Machine ... 8

3.4. Installing Terminating Machines 122754-3 and -4 into Komax Model 43 Machine ... 9

4. INTERFACING WITH KOMAX MACHINE VIA CONNECTOR J3 11

5. OPERATION 13

5.1. Applicator Installation 13

5.2. Setup 15

5.3. Manual Cycling 15

5.4. Mode Selection 15

5.5. Manual Precision Adjustment Lever 17

5.6. Switching Between End and Side Feed Applicators 17

6. PREVENTIVE MAINTENANCE 17

6.1. Cleaning 17

6.2. Lubrication 17

7. ADJUSTMENTS 18

7.1. Measuring Shut Height 18

7.2. Shut-Height Adjustment 20

7.3. Precision Adjust Crimp Height Adjustment 21

7.4. Tonk Lever Adjustment 21

7.5. Drive Belt Tension Adjustment 23

8. TROUBLESHOOTING 24

9. REVISION SUMMARY 26

Komax is a trademark.



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

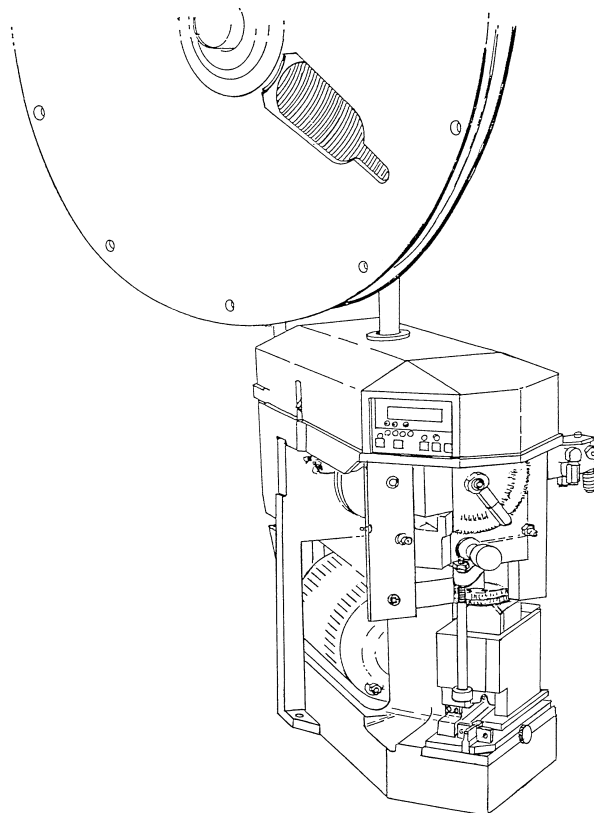


Figure 1

1. INTRODUCTION

This manual contains information on the installation, operation, and maintenance of the AMP-O-ELECTRIC Model "G" Terminating Machines 122754-1 through -5. See Figure 1. Terminating Machines 122754-1 and -2 are designed to be used with Komax Model 40 machine, Terminating Machines 122754-3 and -4 are designed to be used with Komax Model 43 machine, and Terminating Machine 122754-5 is a generic unit designed to be used on other lead-making machines to crimp terminals to wire. To set up and operate the Komax machines, refer to the customer manual supplied with the machine.

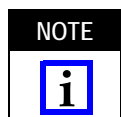
When reading this manual, pay particular attention to DANGER, CAUTION, NOTE statements.



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

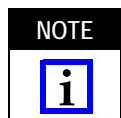


Denotes a condition which may result in product or equipment damage.



Highlights special or important information.

Reasons for reissue of this customer manual are provided in Section 9, REVISION SUMMARY.



Measurements are in metric units [followed by U.S. customary units in brackets].

Read this manual thoroughly before operating the terminating machine. The performance of this terminating machine will depend largely upon the intelligent use of the information contained in this manual.

2. DESCRIPTION

2.1. Functional

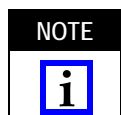
AMP-O-ELECTRIC Model "G" terminating machines are designed to accept a variety of end-feed and side-feed miniature applicators, as well as applicators that are used with the AMP-O-ELECTRIC Model "K" terminating machines and Model "T" terminating machines.

— The **motor-pulley group** includes an ac motor which drives a pulley by a toothed belt. The motor is activated each cycle, rotating the crankshaft through a partial or full revolution, depending on the full-cycle and/or split-cycle setting.

— The **crankshaft-ram group** converts the motor pulley rotational force to the up-and-down action of the ram for driving the applicator during the crimping cycle.

— The **base plate** provides the mounting surface on which the applicator is installed. The quick-release applicator base clamp permits fast, easy installation and removal of the applicator.

— The **manual precision adjustment lever** uses an eccentric located in the ram linkage and a lever with detented stops to adjust the crimp height. Moving the precision adjustment lever in either direction will change the crimp height in increments of 0.0127 mm [.0005 in.] per step.



An automatic precision adjustment feature is also available on terminating machines that are used with machines equipped with a crimp quality monitor (CQM). The automatic precision adjustment feature performs the same function as the manual precision adjustment lever.

2.2. Electrical

The electrical components of each terminating machine consists of an operator control panel, a motor, and a CPU/motor controller package. Each terminating machine operates on 100-220 Vac, 50/60 Hz, single-phase current and will automatically detect the supply voltage and adjust the controller accordingly. A main power switch/circuit breaker (which connects the ac power to the control system) is located on the top left side of the terminating machine. Refer to Figure 2 for terminating machine specifications and capabilities.

Specifications

Capacity:	22,241 N [5,000 lb-force] Maximum Crimp Force
Deflection:	0.076 mm [.003 in.] Maximum per 4,448 N [1,000 lb-force] Crimp Force
Noise:	76 dB Maximum at 22,241 N [5,000 lb-force] at Full Capacity
Weight:	109 kg [240 lb] Approximately
Height:	508 mm [20 in.]
Electrical:	100-220 Vac, 50/60 Hz Single-Phase Current Average 6.5 A at 120 Vac When Used in Combination with Automatic Lead-making Equipment at 5,000 Cycles per Hour Operating Rate
Air:	620-760 kPa [90-110 psi] 2.83 liters/sec [6 scfm] When required for Use with Air-feed Applicators

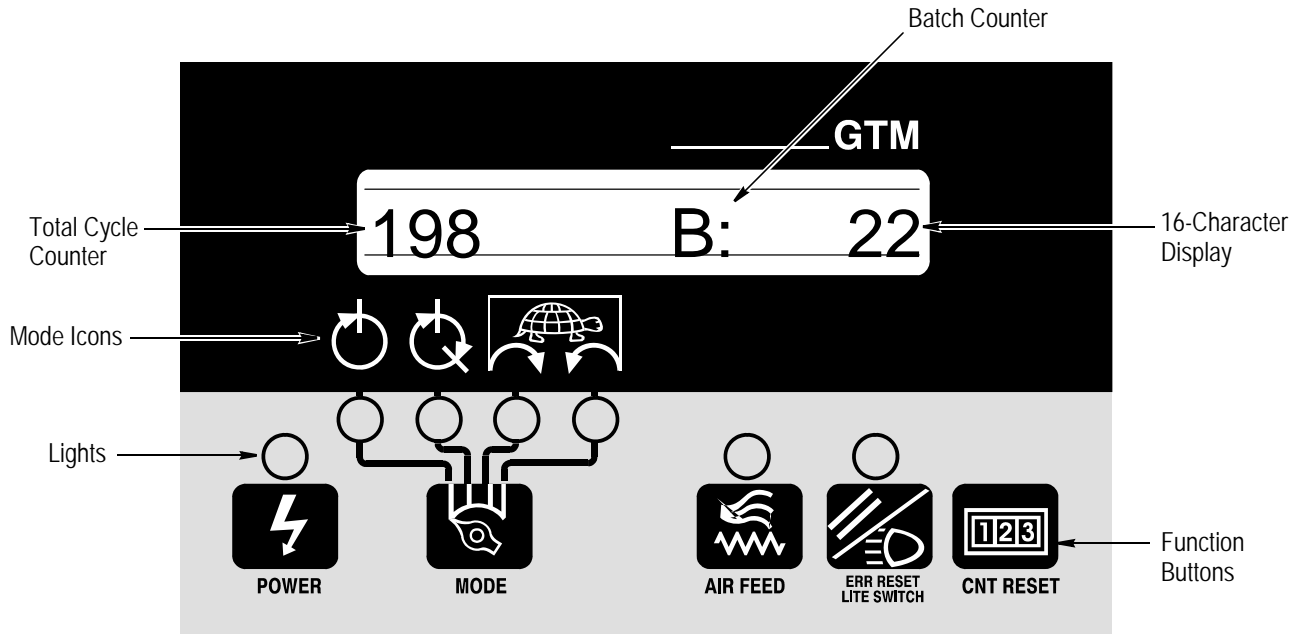
Figure 2

The operator control panel, shown in Figure 3, is mounted to the frame of the terminating machine. The control panel consists of a 16-character display and five buttons marked with icons depicting each function. The display shows total machine cycles and a batch count. A remote operator control panel is attached to the reel support post which can be adjusted for easy access and visibility.



DO NOT plug the terminating machine into an electrical outlet while the machine's power switch is turned ON. A high inrush of current can cause sparking at the plug and may cause the plug to weld to the electrical outlet.

Operator Control Panel



FUNCTION BUTTONS

Function

POWER



Allows the controller to provide power to the motor.

MODE



Selects the current mode of operation by stepping through the four choices indicated.

AIR FEED



Manually activates the optional air feed valve.

ERR RESET/LIGHT SWITCH



Resets the control unit after an error was encountered.

COUNTER RESET



Resets the batch counter in the display.

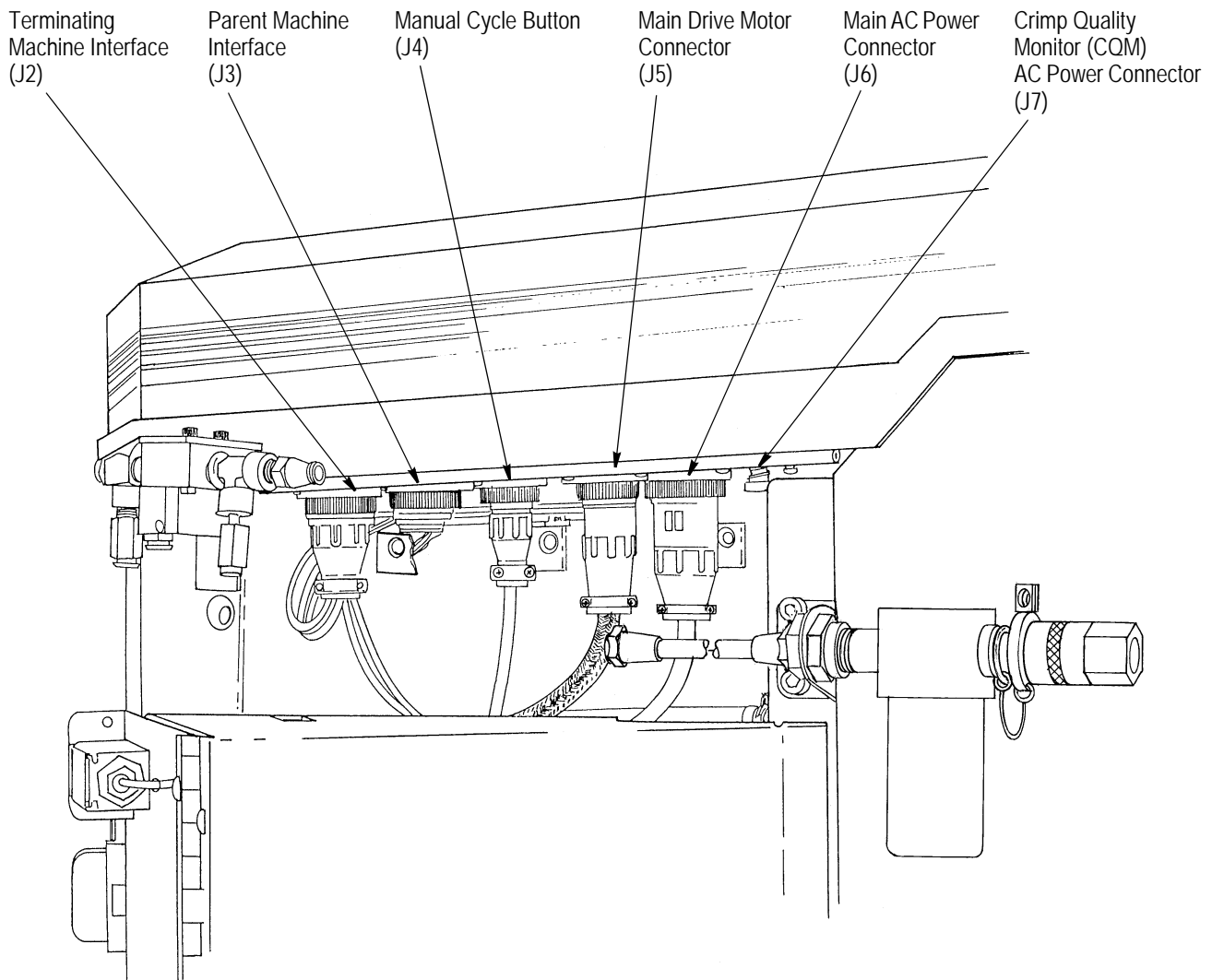
Figure 3

The CPU/motor controller is located under the top cover of the terminating machine. The controller is a modular unit that contains all of the electronics necessary to operate the terminating machine.

There are seven circular plastic connectors (CPC) located on the electrical control box. See Figure 4. The interface connection to the crimp quality monitor (CQM), connector J1, is located on the left side of the terminating machine, just below the top cover. The remaining six are located along the right side of the terminating machine, just below the top cover. Starting at the front of the terminating machine (immediately behind the air feed solenoid) are connections for: the terminating machine interface (J2), the parent machine interface (J3), the manual cycle button (J4), the main drive motor connector (J5), the main ac power connector (J6) and the crimp quality monitor ac power connector (J7).



The CPU/motor controller unit contains high voltages which can maintain power even after the power supply has been disconnected from the terminating machine. When servicing the controller unit, exercise caution when handling the unit to avoid electrical shock.



Note: Interface Connection (J1) to crimp quality monitor (CQM) is located on the left side of the terminating machine.

Figure 4

3. RECEIVING INSPECTION AND INSTALLATION

3.1. Receiving Inspection

The terminating machine is thoroughly inspected during assembly. A final series of inspections is also made to the machine before it is shipped to insure the proper function of the machine.

It is recommended that the machine be inspected immediately upon its arrival at your facility to ensure it has not been damaged during shipment. If damage is evident, notify TE Connectivity immediately.

3.2. General Installation



The AMP-O-ELECTRIC Model "G" terminating machine is heavy. To avoid personal injury, do not attempt to lift the machine by hand.

1. Place the terminating machine crate onto a stable bench or work area. It is recommended to install Optional Lift Eye 354577-1 when hoisting the machine. These instructions reflect the use of this accessory. See Figure 5.



If using the optional lift eye, install the lift eye carefully. A 19.05-mm [.75-in.] thread length is required for the lift eye to support the machine. Make sure the locking screw for the reel support is backed out in order to achieve the thread length engagement required to lift the machine.

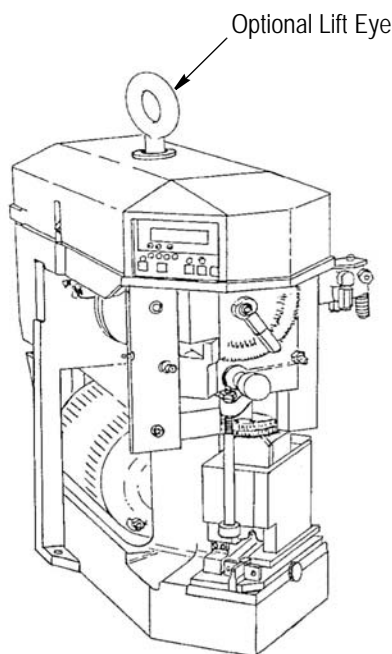


Figure 5

2. Remove all mounting bolts securing the terminating machine to the shipping pallet.
3. Attach a suitable hoist to the lift eye, lift the terminating machine, and place it in the selected operating location. After the machine is in final position, remove the lift eye and replace it with the reel mounting support included with the machine.



When the terminating machine is mounted in the Komax machine, it is mounted off center within the terminating machine mounting post. All mounting screws must be tightened before releasing the terminating machine from the hoist. The terminating machine will fall off the mounting post if it is not properly secured before releasing the hoist.



Do not attempt to cycle the terminating machine with the lift eye in place. Damage to the machine could occur if the lift eye is not removed prior to operation.

4. Insert the reel support post into the hole in the top of the machine and turn the post *clockwise* until the threads begin to bottom out. Then turn the post *counterclockwise* until the flat on the threaded portion of the reel support is aligned with the locking screw. Tighten the screw.

5. Attach the reel support arm to the reel post. Be sure to align the tabs on the reel support arm with the slots in the end of the reel support post. The adjusting screw should be to the right side (while facing the machine) of the horizontal bar on the support post. Secure the reel support arm to the post by inserting the locking pin into the hole in the support post.

3.3. Installing Terminating Machines 122754-1 and -2 into Komax Model 40 Machine

1. Install the interface cable (part number 189274-1) and power cable (part number 189276-2).
2. Attach the remote display unit to the reel support post. Slide the display assembly over the post and position as desired. Tighten the clamp lever to secure the display assembly to the post.
3. Connect the ribbon cable (part number 189425-1) located on the top of the controller to the 9-pin D connector located on the side of the remote display.
4. Remove the eject transfer jaws and replace them with the extended transfer jaws supplied with the interface kit. See Figure 6. Verify all of the clearances required for proper operation of the transfer assembly and make any adjustments, if necessary. For adjustment procedures, refer to the customer manual supplied with the Komax Model 40 machine.

Komax Model 40 Machine—Minimum Wire Extension for Station No. 2

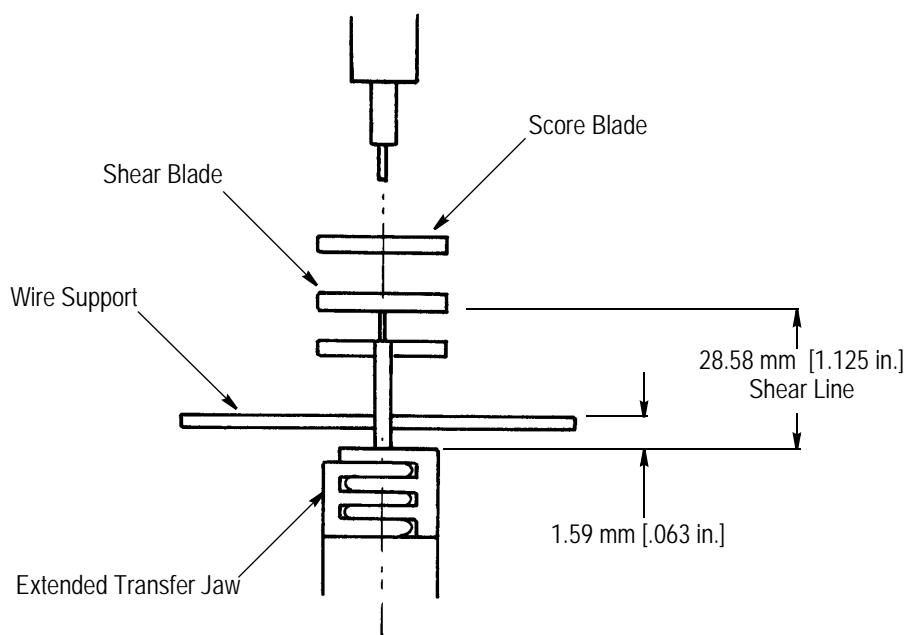


Figure 6

5. Loosen the three mounting screws securing the eject stacker cylinder and adjust it away from the terminating machine as far as possible. Tighten the mounting screws. See Figure 7. Check for proper clearance throughout the movement range of the stacker jaws.
6. Remove the eject stacker jaw mounting plates and replace them with one of the mounting plates included with the interface kit. See Figure 7.
 - a. Install the long plates for inside gripping (stacker jaws grip the wire between the transfer jaw and the applicator) of the wire.
 - b. Install the short plates for outside gripping (jaws grip the wire behind the transfer jaws) of the wire.
7. Verify the rotation of the stacker jaw and adjust the stop positions if necessary.

Komax Model 40 Machine—Stacker Unit and Model "G" Terminating Machine Dimensional Relationships

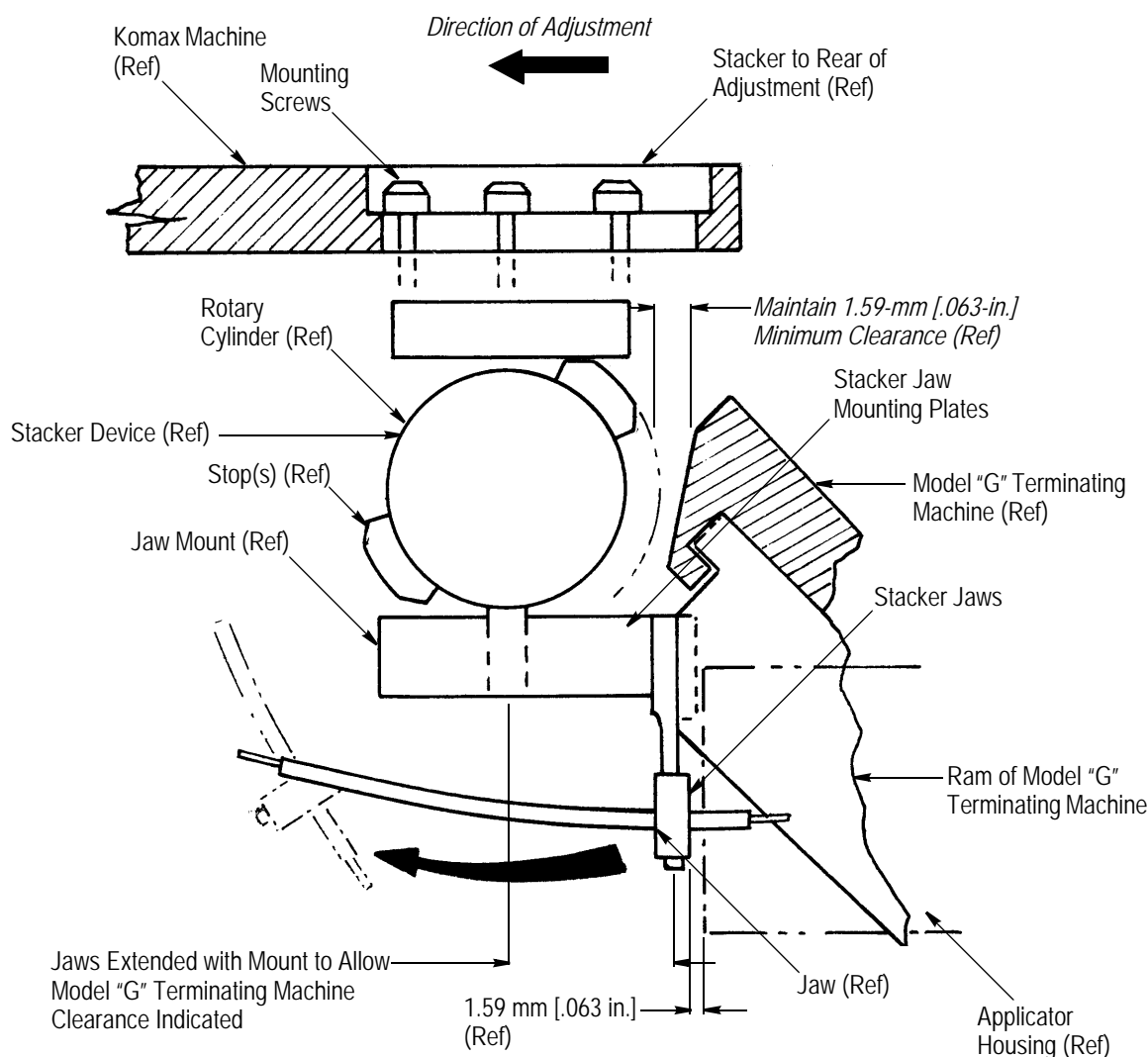


Figure 7

3.4. Installing Terminating Machines 122754-3 and -4 into Komax Model 43 Machine

1. Install the interface cable (part number 189070-1) and power cable (part number 189276-1).
2. Attach the remote display unit to the reel support post. Slide the display assembly over the post and position as desired. Tighten the clamp lever to secure the display assembly to the post.
3. Connect the ribbon cable (part number 189425-1) located on the top of the controller to the 9-pin D connector located on the side of the remote display.
4. Install the tonk assembly (supplied with the installation kit) onto the ram post adaptor of the Model "G" terminating machine. Refer to Figure 8 for proper installation of the tonk assembly.

Tonk Assembly Setup for Komax Model 43 Machine

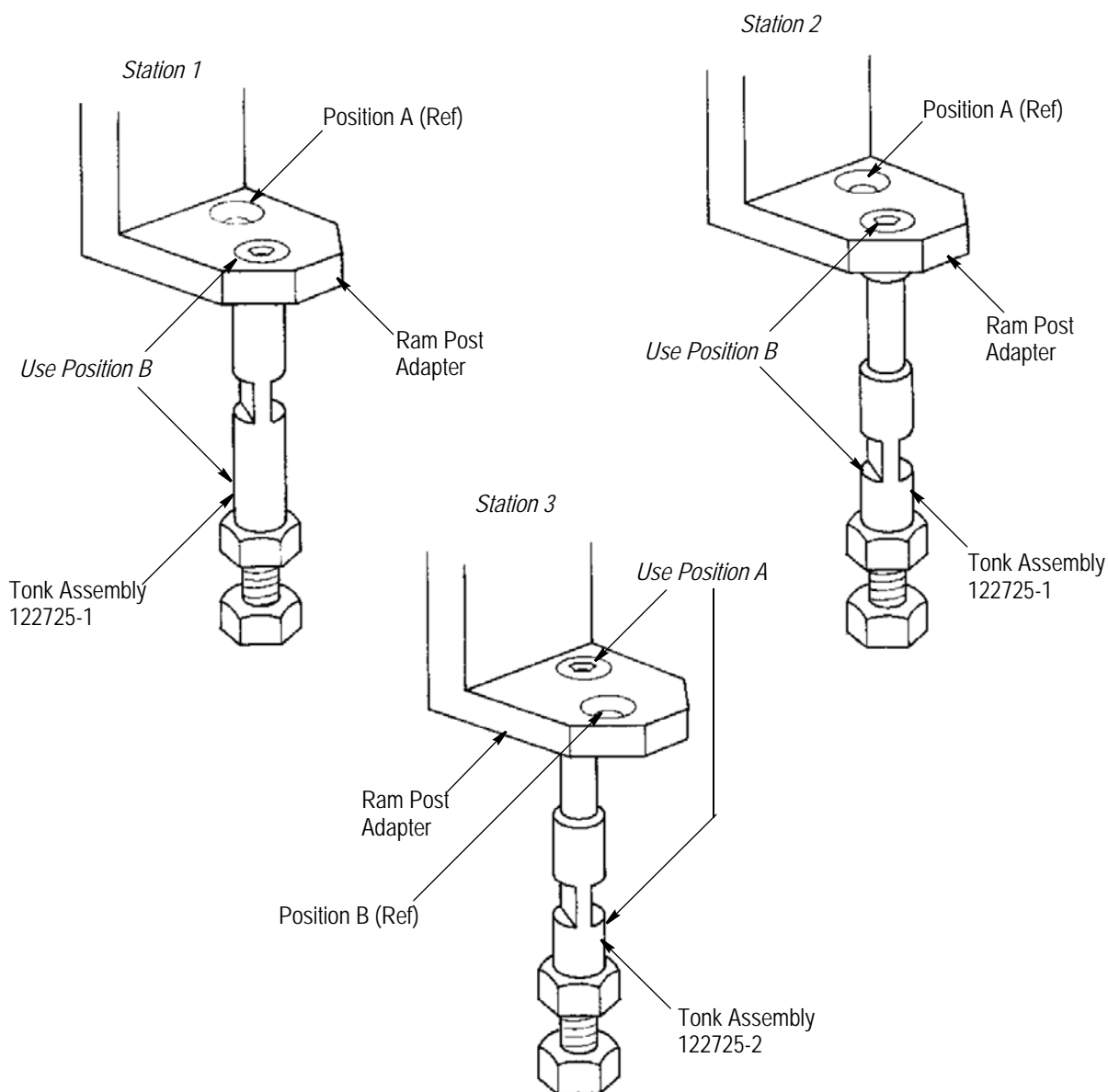


Figure 8

4. INTERFACING WITH KOMAX MACHINE VIA CONNECTOR J3

This section describes all of the input and output signals used to interface with the Komax machine via connector J3 (parent machine interface).

Pin 1 *Tooling Up and Error Code Bit 0*

This pin has two uses. When the terminating machine is not in error, this output is turned on when the terminating machine ram is up. When the terminating machine is not running, this output is on whenever vane switch No. 2 (located on the back of the terminating machine) is in the up position slot. When the terminating machine cycles, the output turns off as soon as the motor starts to move, and turns on again shortly after the wire is clear of the tooling and is able to be moved. If the terminating machine is in error (READY output is off), the line is used as bit 0 of a 3 bit error code.

Pin 2 *Tooling Down and Error Code Bit 1*

This pin has two uses. When the terminating machine is not in error, this output is turned on when the terminating machine ram is down. When the terminating machine is not running, this output is on whenever vane switch No. 2 (located on the back of the terminating machine) is in the split cycle position slot. In the full cycle mode, the terminating machine cycles and the output turns on for 70 m/sec when the ram reaches the split cycle position. In the split cycle mode, this output is turned on when the terminating machine is in the split cycle position. This output turns off 130 m/sec after the terminating machine starts. If the terminating machine is in error (READY output is off), the line is used as bit 1 of a 3 bit code.

Pin 3 *Terminating Machine in Split-Cycle Mode and Error Code Bit 2*

This output is turned on whenever the terminating machine is in the split cycle mode. If the terminating machine is in error (READY output is off), the line is used as bit 2 of a 3 bit error code.

Pin 4 *Terminating Machine Ready*

The following conditions apply:

- This output is turned on whenever the terminating machine is ready to receive a start signal
- This output is turned off if an error is displayed
- This output flashes (at 1 Hz) if a warning is displayed

NOTE



Warnings are a special case of CQM errors when a CQM is used with Komax machines and are only displayed if Pin 26 is pulled low.

ERROR CODES (On Pins 1, 2, and 3)

- Code 0 Motor Over Temperature
- Code 1 Switch 1 Not Unmade
- Code 2 Switch 1 Not Made
- Code 3 Switch 2 Not Made
- Code 4 Motor Relay Open
- Code 5 CQM Motor Fault
- Code 6 All Other Errors
- Code 7 No AC Power on Terminating Machine

Pin 8 *Good Crimp (Cycle Complete) Pulse*

If a CQM is NOT connected to the terminating machine, this output is turned on (transistor on) for 50 m/sec after the tooling down output signal (Pin 2) turns off, indicating the wire has cleared the tooling and can be moved.

If a CQM is connected to the terminating machine, this output is turned on (transistor on) for 50 m/sec when the CQM signals a good crimp and the tooling down output has been turned off.

Pin 9, 15 Start (Full and Split Cycle)

This signal is used to start the terminating machine. In the full cycle mode, the machine completes one cycle for each start signal. In split cycle mode, the machine moves from home to the split cycle position or the split cycle position to home when a start signal is received.

The start signal must be removed and re-applied for the terminating machine to cycle again. The start signal must be applied for a minimum of 0.5 m/sec.

If ac power is applied to the terminating machine while the start signal is on, the terminating machine will go into error and display a message.

Unlike the foot switch, the start signal will cycle the terminating machine in full or split cycle mode even if the front panel is in the JOG mode (the front panel power light must be on and the machine cannot be in error).

Pin 14, 20 Air Feed

This signal turns on the air valve for as long as the signal is active. The terminating machine does not need to be cycling for the air valve to be turned on by this signal. If Pin 26 is on, the signal is ignored.

Pin 21 Mode Select (Full or Split Cycle)

When this signal is off (not connected) and the reset error (Pin 25) is pulsed, the terminating machine will be put in the full cycle mode. The front panel light will change to full cycle just as if the mode were changed from the front panel. When this signal is on (pulled high) and the reset error

Pin 25 is pulsed on and the terminating machine will be put in the split-cycle mode.

Pin 22, 24 Motor Relay

The motor relay circuit is primarily an optical isolator that interrupts the supply voltage used to turn on the transistors that operate the motor. The motor relay optical isolator is designed with an internal bypass optical isolator. Software controls the bypass optical isolator. The software turns on the bypass whenever the motor is not in motion. Also, the motor relay is software-bypassed when the operator sets the bypass mode before jogging the terminating machine. On bench model machines, the motor relay is wired to the guard switch through J2-23.

Pin 25 Reset Error

This signal is used in two ways. If the terminating machine is in error and this signal is received, the terminating machine will reset as if the front panel error reset key were pushed. If the terminating machine is not in error and this signal is received, the terminating machine will be placed in the full or split mode as requested by the Mode Select Signal (Pin 21).

The reset error input is looking for a pulse voltage to be applied. The pulse must be a minimum of 40 m/sec.

Pin 26 Use Internal Air Feed Signal and Activate CQM Warning Software

If this line is turned on (pulled low), then the internal air feed signals are used to activate the air feed valve. The air feed is activated as if the start signal came from the foot switch.

If this line is off (left open), then the air feed signal is taken from Pins 14 and 20.

CQM Warning Messages:

The warning message software in the terminating machine is active if the CQM is connected and Pin 26 is pulled low. Warning messages differ from CQM errors in that the error light is not turned on and the green ready light (Pin 4) is flashed rather than turned off.

CQM Not Powered:

This warning appears if the CQM is not powered. If the machine cycles the terminating machine, the warning is removed and the terminating machine operates normally. If the CQM is powered down and the terminating machine has been cycled, this warning will not be displayed.

If the terminating machine is cycled with its cycle switch, then the warning becomes an error.

CQM Not Ready:

This warning appears if the CQM is powered but not in the run or calibrate mode. If the machine tries to cycle the terminating machine, the warning becomes an error.

5. OPERATION

5.1. Applicator Installation



Make sure that the manual precision adjustment lever has been returned to the 0.00-mm [.000-in.] position before installing the applicator. Refer to Paragraph 7.3.

1. Loosen the thumbscrew on the applicator base clamp and slide the clamp down. See Figure 9.
2. Lower the ram lock mechanism by loosening the thumbscrew at the front of the ram post adaptor.
3. Place the applicator onto the base plate of the terminating machine. Slide the applicator back until the two notches in the applicator base plate engage the rear stops. At the same time, guide the applicator ram into the ram post adaptor, making sure the applicator ram engages the ram lock mechanism. See Figure 10.

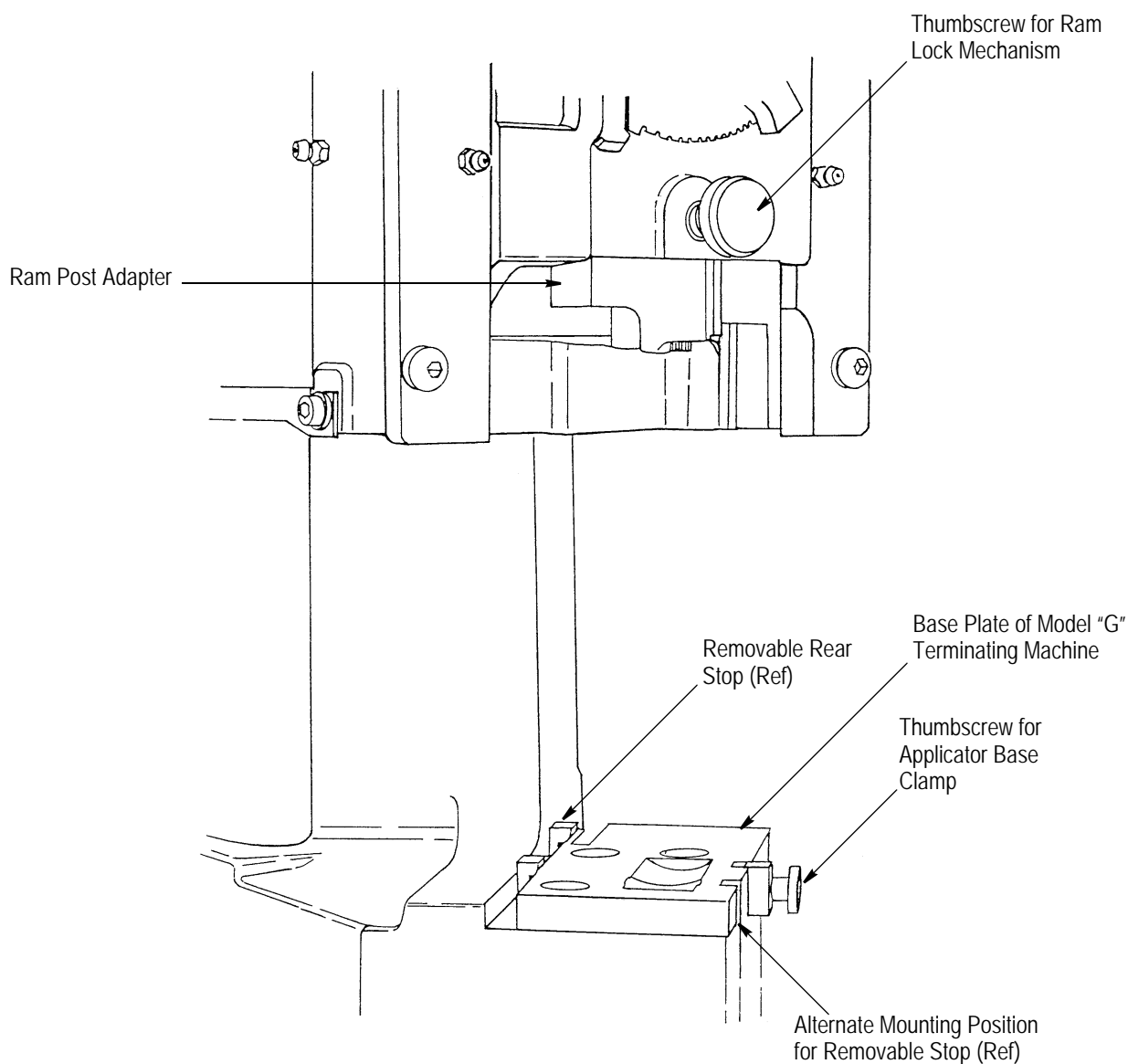


Figure 9

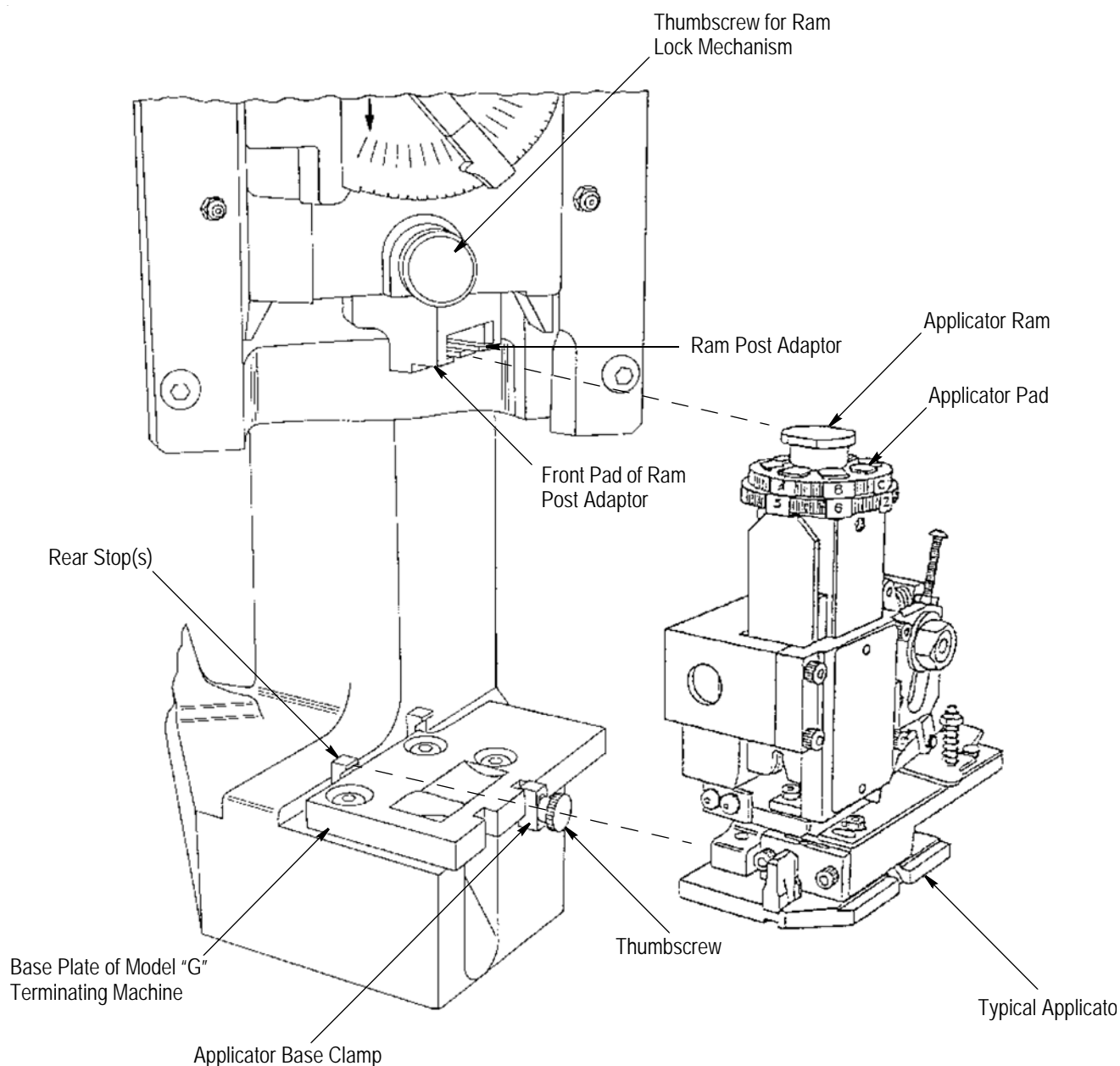


Figure 10

4. Slide the applicator base clamp UP and re-tighten the thumbscrew to secure the applicator in place.

NOTE



When using Applicator 567200-1 (originally intended for the AMP-O-ELECTRIC Model "K" terminating machine), remove the thumbscrew for the applicator base clamp and the removable rear stop located on the right side of the base plate. Re-install the rear stop at the alternate mounting position on the base plate. Refer to Figure 9.

5. 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 adaptor. See Figure 10.
6. Secure the applicator ram to the ram post adaptor by turning the thumbscrew for the ram lock mechanism *clockwise* until tight. See Figure 10. If the applicator is an air-feed type, connect the air lines to the valve located on the right side of the terminating machine.
7. Adjust the reel support for side-feed or end-feed product, depending on the applicator being used.

8. Mount the terminal reel onto the reel support. Thread the terminal strip into the applicator according to the applicator instruction sheet supplied with the applicator. If necessary, adjust lubrication bowl.
9. Align reel brake to lead-in to applicator.
10. On end-feed applicators, adjust the lead-in tube so that the terminal strip enters the strip guide of the applicator without bending or stressing the terminal strip.

5.2. Setup

1. Turn on the power to the terminating machine with the main power switch/circuit breaker (located on the left side of the terminating machine).
2. Position the terminal (without a wire) in the applicator, as described in the applicator instruction sheet. Place the terminating machine in JOG mode (Forward) (refer to Figure 11) and carefully cycle the terminating machine through a complete crimp cycle.

NOTE



If desired, the terminating machine can be cycled manually. Disconnect the power supply to the machine and turn OFF power to the terminating machine with the main power switch/circuit breaker. Remove the rear cover. Use a 19-mm wrench on the nut in the center of the large pulley to manually turn the crankshaft.

3. Inspect the terminal to ensure it has been properly crimped. If an improper crimp is attained, check the position of the terminal in the applicator using the applicator instruction sheet. Repeat Steps 2 and 3 until a proper crimp is attained.
4. Select the desired mode of operation as described in Paragraph 5.4, Mode Selection.
5. Place a prepared wire in the terminal and press the manual cycle button to crimp the wire to the terminal. Inspect the terminal for a proper crimp.

5.3. Manual Cycling

The terminating machine is provided with a manual cycle button located on the left side of the machine next to the power connection for the dereeler assembly. Pressing the manual cycle button will cause the ram to cycle according to the selected operating modes described in Figure 11.

Perform the following steps to manually cycle the terminating machine:

1. Verify that the power indicator light located above the power button on the terminating machine control panel is ON. If not, press the power button on the control panel to power-up the terminating machine for cycling. See Figure 3.

NOTE



When power is first applied to the terminating machine, the machine will automatically turn the power light ON as part of the initialization process.

2. Select the desired operating mode. Refer to Figure 11.
3. Press the manual cycle button to cycle the terminating machine.

NOTE

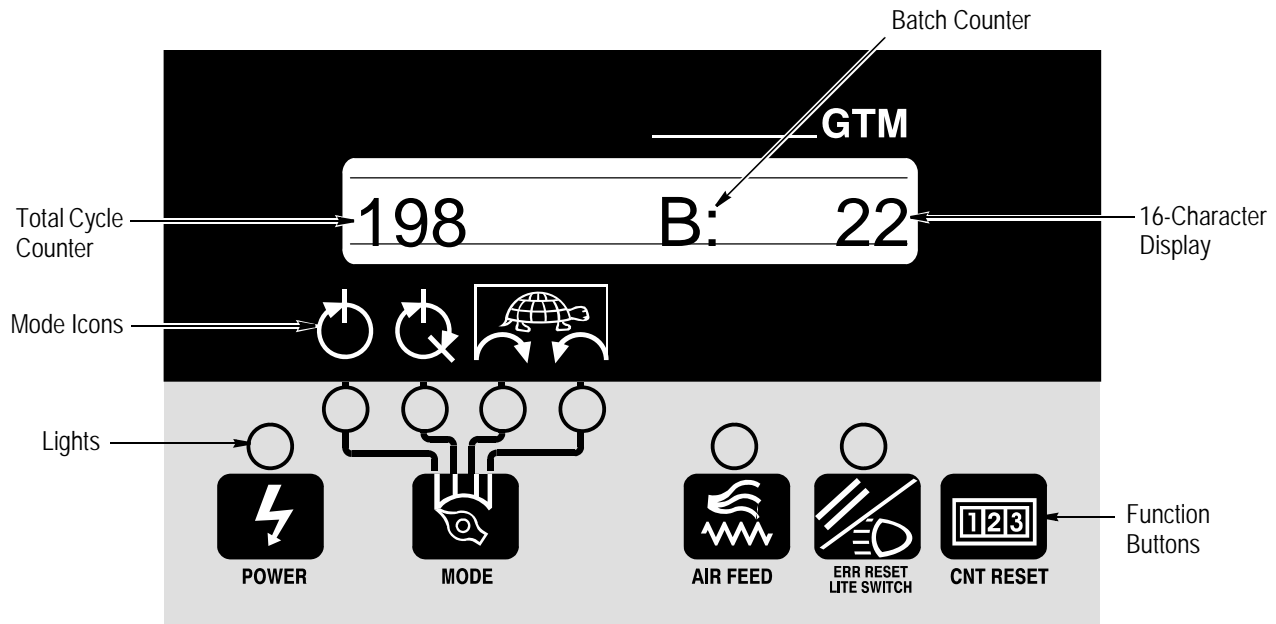


When the manual cycle button is pressed and held in the full cycle or JOG modes, the terminating machine will complete one cycle and stop with the ram in the "fully retracted" position. The manual cycle button must be released and pressed again to initiate another cycle. In the split cycle mode, the ram will move partially down to capture the terminal in the tooling (without crimping it). After the wire is inserted into the terminal, the manual cycle button must be pressed again to complete the cycle (crimping the wire to the terminal) and return the ram to the "fully retracted" position.

5.4. Mode Selection

Each terminating machine is capable of four primary modes of operation which are accessed through the operator control panel. The current operating mode is indicated by green lights located above the function buttons and below the mode icons. Select an operating mode by pressing the MODE function button until the light under the desired icon is ON.

Operating Modes on Operator Control Panel



FUNCTION BUTTONS

Function

FULL CYCLE



When the manual cycle button is pressed in this mode, or a cycle signal is received from the parent machine, the crankshaft will rotate at full speed through a full revolution.

SPLIT CYCLE



When the manual cycle button is pressed in this mode, or a cycle signal is received from the parent machine, the ram will move partially down to capture the terminal in the tooling (without crimping it). After the wire is inserted into the terminal, the manual cycle button must be pressed again or a cycle signal is necessary to complete the cycle (crimping the wire to the terminal) and return the ram to the "fully retracted" position.

JOG MODE (Forward)



When the manual cycle button is pressed in this mode, the crankshaft moves in the forward direction at a reduced speed. The motor is activated only while the manual cycle button is pressed and held. Power to the motor is removed immediately when the manual cycle button is released. The motor automatically stops when the ram is returned to the "fully retracted" position.

NOTE: The ram may drift down if the manual cycle button is released in mid stroke.

CAUTION: While in JOG mode, attempting to complete a crimp cycle with terminals and wire in the applicator may cause the motor to stall. Although the terminating machine can terminate some smaller terminals and wire, the motor may be unable to complete the cycle. It may be necessary to either reverse or turn OFF the machine and manually return the ram to the "fully retracted" position.

JOG MODE (Reverse)



This mode allows a slow speed jog in the reverse direction. Operation is similar to the JOG mode (Forward).

Figure 11

5.5. Manual Precision Adjustment Lever

The manual precision adjustment lever is used to adjust the crimp height. For adjustment procedures, refer to Paragraph 7.3, Precision Adjust Crimp Height Adjustment.

5.6. Switching Between End and Side Feed Applicators

When changing from end feed to side feed applicators or side feed to end feed applicators, the reel support assembly and the dereel assist motor assembly must be relocated to the opposite side of the terminating machine.

1. With the terminal reel removed, flip the horizontal reel support bar to the opposite side of the terminating machine. Mount the terminal reel on the reel support and load the terminal strip into the applicator.
2. Unplug the power connector for the dereel assist motor. Lift the dereel motor assembly up and toward the rear of the terminating machine to remove the motor assembly. Slide the motor assembly onto the mounting bolts on the opposite side of the terminating machine. Insert the power cable into the socket located directly above the motor assembly.

6. PREVENTIVE MAINTENANCE

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



Before performing maintenance on the terminating machine, ALWAYS disconnect the power supply to the machine. Turn OFF power to the terminating machine with the main power switch/circuit breaker. If applicator is an air-feed type, DISCONNECT air lines to valve located on the right side of the terminating machine.

6.1. Cleaning

Clean any debris from the applicator area.



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 applicator is installed, check and replace the air filter element if necessary.

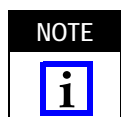
Remove dust that may have accumulated on the screen covering the motor cooling fan. Periodically remove the screen and clean thoroughly.



DO NOT blow air into the screen while the screen is mounted to the terminating machine.

6.2. Lubrication

The moving parts of the machine require regular lubrication to ensure reliable service and long life. Use only Chevron Ultra Duty EP NLGI No. 2 grease, Pennzoil Pennlith Ultra EP NLGI No. 2 grease, or Conoco Syncon EP NLGI No. 2 Heavy Duty grease.



If the terminating machine shows difficulty operating in low temperatures, use EP NLGI No. 1 grease for lubrication.

Using a grease gun, apply grease every 250,000 cycles to these lubrication points:

- 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;
- the pivot pin on the manual precision adjustment lever.

DANGER


To avoid personal injury, exercise caution when machine is connected to power supply and terminating machine is turned on.

NOTE


Excess grease may drip down applicator if the grease is not removed from the ram slides, gibs, and frame. When lubrication is complete, re-connect the power supply to the machine and turn on the power to the terminating machine with the main power switch/circuit breaker. Select the JOG mode (Forward) operation (mode light must be ON); then press the manual cycle button to lower the ram. Remove excess grease from the ram slides, gibs, and frame. Press the manual cycle button again to complete the cycle and return the ram to the "fully retracted" position.

7. ADJUSTMENTS

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

DANGER


Before making any adjustments, ALWAYS disconnect the power supply to the machine. Turn OFF power to the terminating machine with the main power switch/circuit breaker. If applicator is an air-feed type, DISCONNECT air lines to valve located on the right side of the terminating machine.

7.1. Measuring Shut Height

The shut height is the distance between the bottom surface of the ram post adaptor and the top surface of the terminating machine base plate. See Figure 12.

NOTE


To ensure optimum function of the shut height gage, make sure the gage is the same temperature as the terminating machine before measuring shut height.

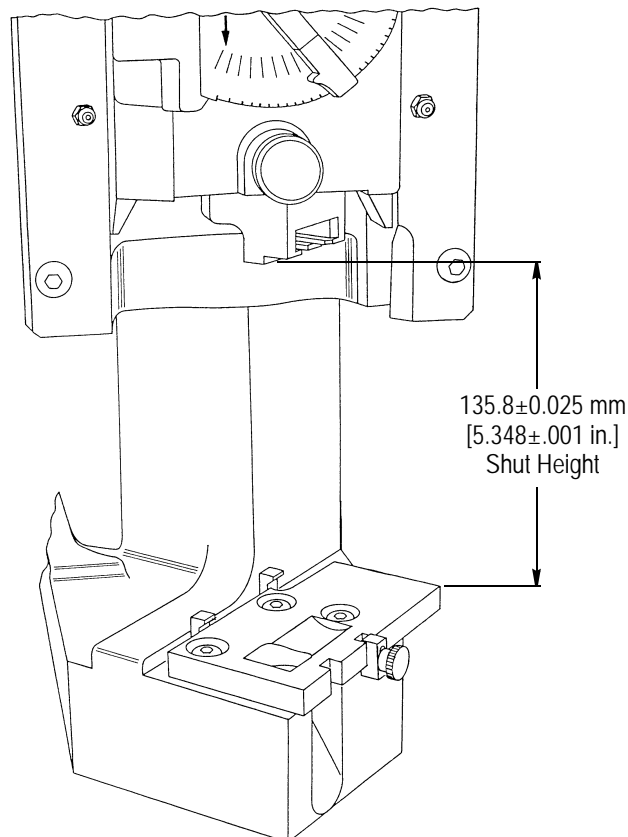


Figure 12

1. Adjust the manual precision adjustment lever to -0.051 mm [$-.002\text{ in.}$] BELOW the 0.00-mm [$.000\text{-in.}$] setting. Refer to Paragraph 7.3.
2. Using a clean dry cloth, wipe the top and bottom surfaces of the shut height gage, the base plate, and the lobes on the bottom of the ram post adaptor.
3. Position shut height gage onto base plate, directly under the ram post adaptor. The dial must be oriented as shown in Figure 13.

NOTE


Do not rotate the shut height gage to any other position. It is recommended that two people check the shut height—one person to turn the pulley and another person to read the dial indicator.

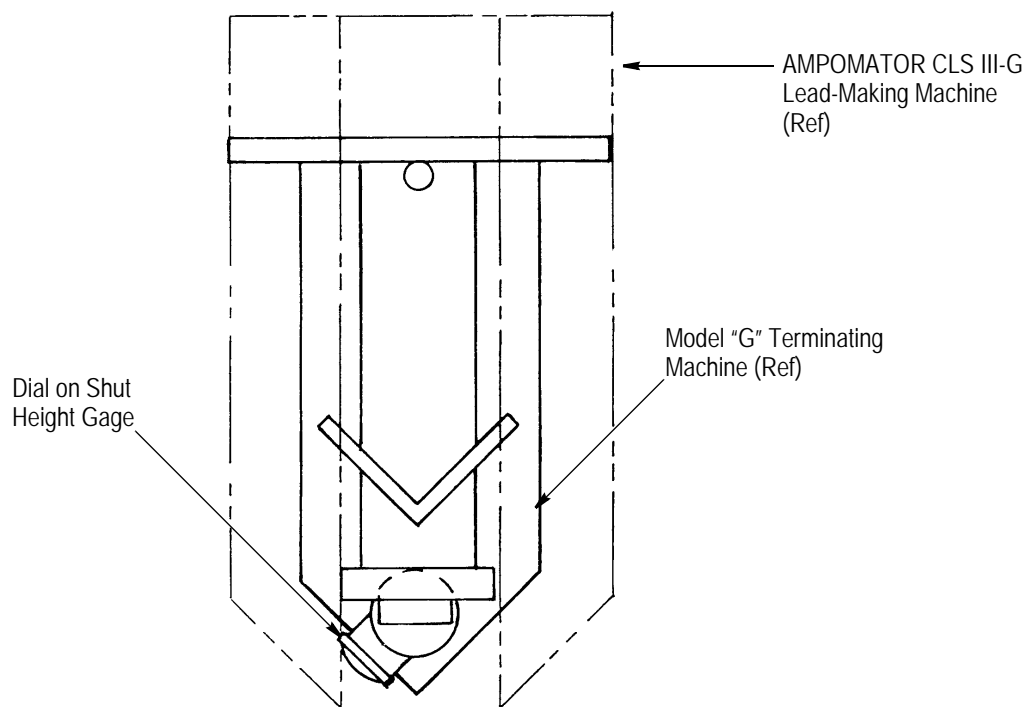


Figure 13

4. Using a 19-mm wrench, rotate the pulley (located at the rear of the terminating machine) to manually cycle the machine until the ram post adaptor is positioned just above the locator plate of the shut height gage. Align the locator plate so that the cutout areas are aligned with the lobes on the ram post adaptor. See Figure 14.
5. After shut height gage is properly aligned, continue to hand cycle terminating machine until the ram post adaptor is FULLY bottomed on the shut height gage. The lobes of the ram post adaptor must be fully seated in the cutout areas as shown in Figure 15.
6. Observe the dial indicator on the shut height gage. The large indicator hand must be on "0" and the small revolution counter hand must be on "0". This is an exact shut height of $135.8 \pm .025\text{ mm}$ [$5.348 \pm .001\text{ in.}$] with a force of $8007 + 0.689 / - 0.00\text{ N}$ [$1800 + 155 / -.000\text{ lbs}$]. It is recommended that a second reading be taken for verification. Allow one minute between cycles for the dial indicator and springs of the shut height gage to reset. Repeat Steps 1 through 6.

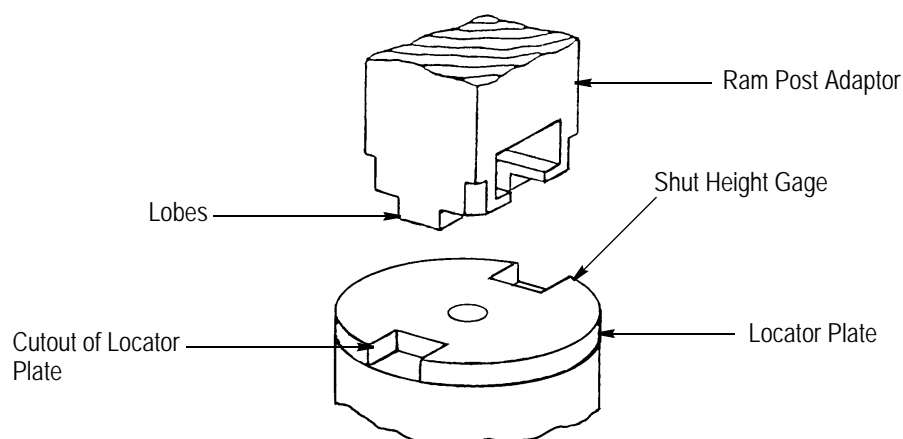


Figure 14

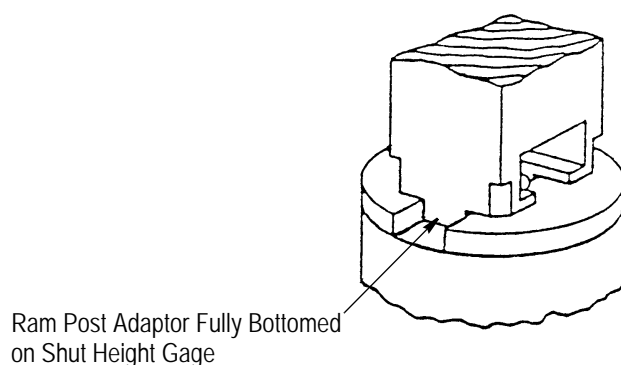


Figure 15

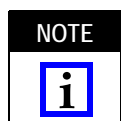
7. After shut height is verified, reset the manual precision adjustment lever to the 0.00-mm [.000-in.] position. Refer to Paragraph 7.3.

7.2. 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 terminating machine, contact a Field Service Specialist, or call the TOOLING ASSISTANCE CENTER at the number at the bottom of page 1.



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.



NOTE The shut height is set to 135.8 +/-0.025 mm [5.348 +/- .001 in.] so that mini applicators do not require re-shimming. When measuring the shut height with the shut height gage, it will be necessary to set the manual precision adjustment lever to 0.051 mm [0.002 in.] BELOW the 0.00-mm [.000-in.] setting in order to achieve the proper reading. The indicator dial of the gage should face the operator when the gage is placed in the machine.

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



DANGER Before making any adjustments, ALWAYS disconnect the power supply to the machine. Turn OFF the power to the terminating machine with the main power switch/circuit breaker. If applicator is an air-feed type, DISCONNECT air lines to valve located on the right side of the terminating machine.

1. Check shut height of terminating machine using Shut Height Gage 679655, as described in Paragraph 7.1, Measuring Shut Height.
2. If the shut height is incorrect, proceed as follows:
 - a. Remove the two socket head cap screws which secure the ram post adaptor (part number 354513-1) to the ram assembly. Remove the ram post adaptor and shims.
 - b. Add or remove shims as necessary to achieve the required shut height. Refer to Figure 16 for available shims.
 - c. 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.
 - d. Re-install the socket head cap screws into the ram assembly to secure the ram post adaptor. Re-tighten the screws.
3. Repeat Steps 1 and 2 as necessary until the proper shut height is attained.

SHIM	
PART NUMBER	THICKNESS (mm [in.])
354545-2	0.08 [.003]
354545-3	0.10 [.004]
354545-6	0.25 [.010]
354545-4	0.30 [.012]
354545-5	0.51 [.020]

Figure 16

7.3. Precision Adjust Crimp Height Adjustment

1. Adjust the manual precision adjustment lever to 0.00 mm [.000 in.] by pulling the lever away from the pivot pin. Lock the lever in place by releasing it. See Figure 17.
2. Install the applicator into the terminating machine as described in Section 3, RECEIVING AND INSPECTION.
3. Secure the applicator ram to the ram post adaptor by turning the thumbscrew (located at the front of the ram assembly) *clockwise* until tight. See Figure 8.
4. Cycle the terminating 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 5.
5. Adjust the crimp height by moving the precision adjustment lever:
 - to the right to increase the crimp height; or
 - to the left to decrease the crimp height.

NOTE



Moving the precision adjustment lever in either direction will change the crimp height by approximately 0.0127 mm [.0005 in.] per step.

6. Repeat Step 4 until the appropriate crimp height is obtained.

CAUTION



To avoid damaging the applicator, ALWAYS return the manual precision adjustment lever to the 0.00-mm [.000-in.] position when finished using the applicator.

7.4. Tonk Lever Adjustment

A tonk lever adjustment is required for open barrel applications to properly align the wire with the crimper. For details concerning the adjustment of the tonk lever, refer to the customer manual supplied with the machine.

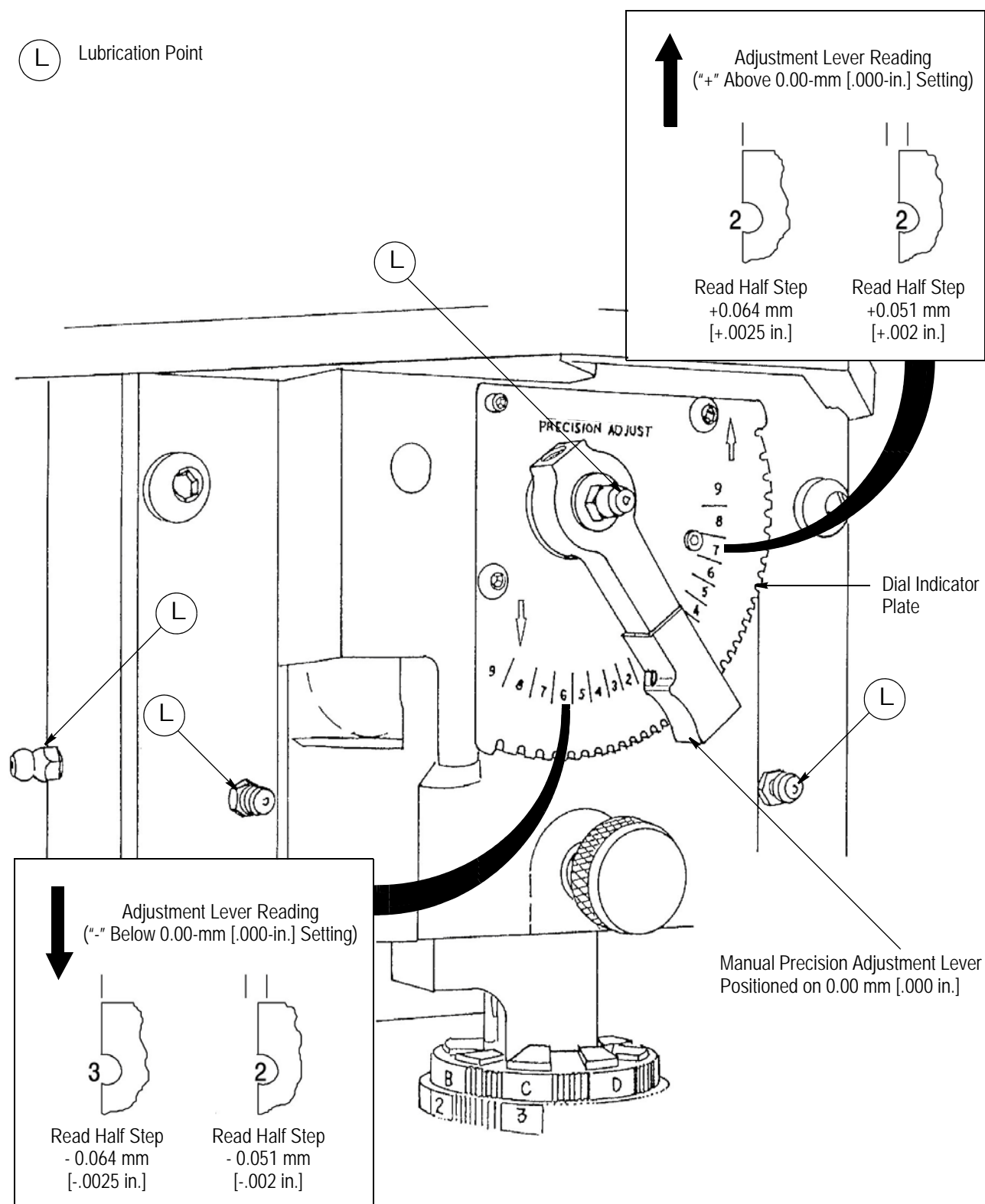


Figure 17

7.5. Drive Belt Tension Adjustment

Adjust the drive belt tension as follows:

1. Position the motor closer to or farther from the upper pulley. Loosen the motor mounting bolts and allow the weight of the motor to automatically tension the belt.
2. Adjust the tension for 6.477-mm [.255-in.] deflection with applied force of 66.7 N [15 lb-force] at a point of 93 mm [3.66 in.] from the bottom of the belt as it clears the bottom of the motor pulley. See Figure 18.



Too much tension on the drive belt will cause premature failure to the motor shaft.

3. Re-tighten the motor mounting bolts when the adjustment is satisfactory.

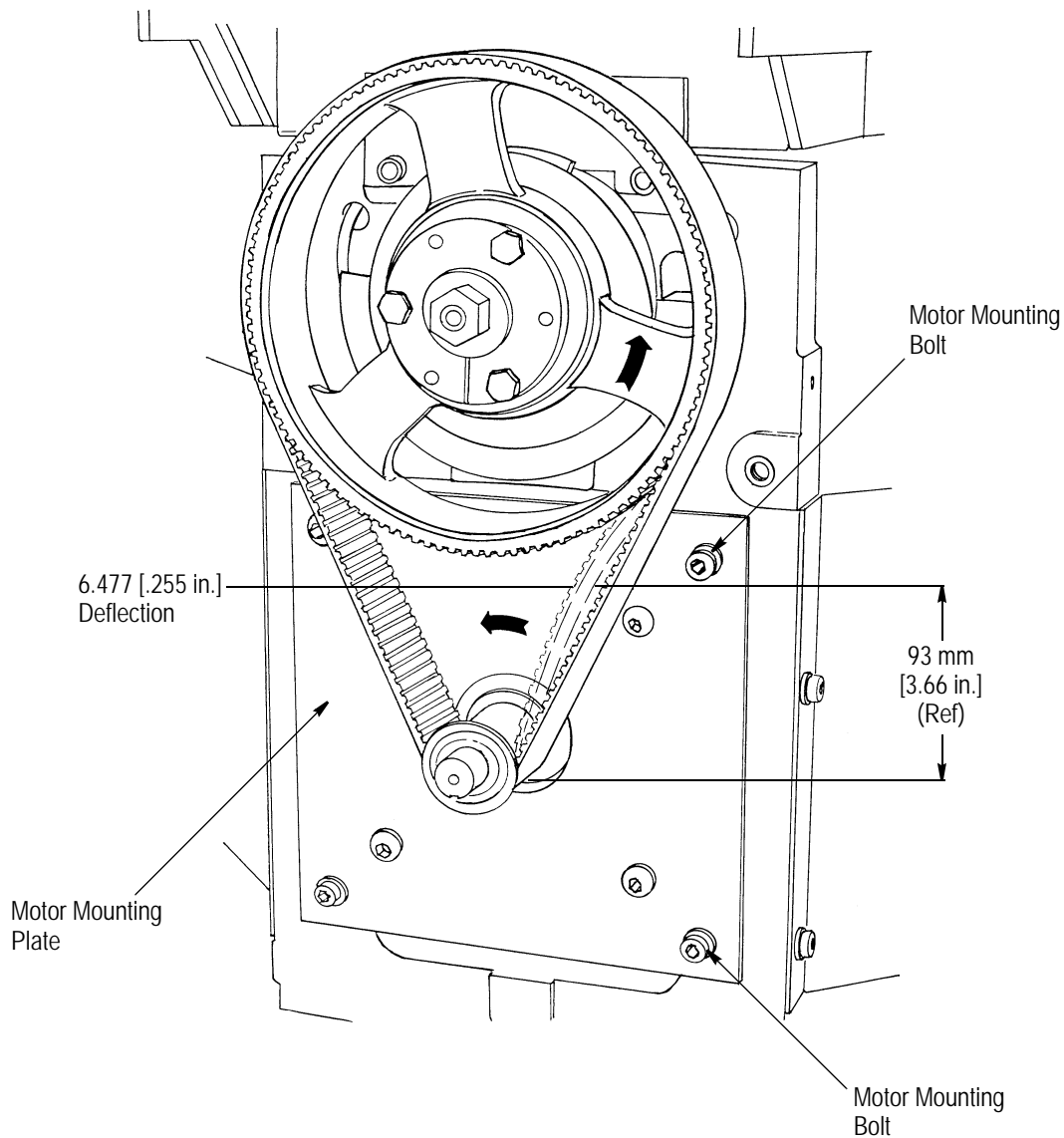


Figure 18

8. TROUBLESHOOTING

Refer to the following table for problems, possible cause, and remedy.

PROBLEM	POSSIBLE CAUSE	REMEDY
AC POWER FAILURE	The motor relay circuit (connected to J3) has opened.	Check if the motor relay connections in jumper positions 11 and 22 and 16 and 24 are seated properly into J3 (parent interface connector).
		Reset the error (press "ERR RESET" key), press the "POWER" key (so light is on), and retry cycling the terminating machine.
CLOSE GUARDS	This message refers to the guards included on the bench version of this machine. After bypassing the guards and the machine is in either the full or split cycle mode, when the guard is opened, this message is displayed. In this machine the guard switch circuits are controlled by jumpers located in connector J2.	Check that the jumper is installed connecting positions 4 and 5 of J2. Also, check that the jumper is installed connecting positions 13 and 14 of J2. Verify that the contacts are fully seated in the connector.
CQM ERROR	The terminating machine did not receive a "good" signal from the CQM for the last termination.	Refer to the CQM display for cause of error.
		Reset the error on the terminating machine to allow continued operation.
CQM MOTOR FAULT	The auto adjust motor drew too much current when activated.	Inspect motor and gearing for debris or binding.
		Reset the error on the terminating machine to allow continued operation.
CQM NOT POWERED	The terminating machine detects a CQM that is connected but not powered up (error appears only on initial power up).	This warning appears if the CQM is not powered. If the machine cycles the terminating machine, the warning is removed and the terminating machine operates normally. If the CQM is powered down and the terminating machine has been cycled, this warning will not be displayed.
		If the terminating machine is cycled with its cycle switch, then the warning becomes an error.
CQM NOT READY	The terminating machine detects a CQM that is connected and powered up but is not in the RUN or CALIBRATE mode.	This warning appears if the CQM is powered but not in the run or calibrate mode. If the machine tries to cycle the terminating machine, the warning becomes an error.
		Set the CQM for either the RUN or CALIBRATE mode, reset the error on the terminating machine and retry.
EEPROM ERROR	The controller has detected a problem with its memory.	Contact a Field Service Specialist.
EXTERN START ON	While powering up, the terminating machine has detected an automatic machine start signal from the parent machine interface (J3).	Check for proper positioning of the contacts at jumper positions 9 and 15 on connector J3 (parent machine interface). Make sure that the contacts are fully seated.
		Check the motor start signal wiring and control systems on the parent machine.
FOOT SW INPUT ON	While powering up, the terminating machine has detected that the manual cycle button was pressed.	Check the manual cycle button for proper operation. Using a continuity meter, pins 1 and 2 of the manual cycle button connector should be normally open, and shorted when the manual cycle button is depressed.

Continues

PROBLEM	POSSIBLE CAUSE	REMEDY
GUARDS FAILED or GUARD SW TIMEOUT	This message refers to the guards included on the bench version of this machine. When the main guard interlock and the insert guard interlock do not open or close at the same time, this message is displayed. In this machine, the guard switch circuits are controlled by jumpers located in connector J2.	Check that the jumper is installed connecting positions 4 and 5 of J2. Also, check that the jumper is installed connecting positions 13 and 14 of J2. Verify that the contacts are fully seated in the connector. Clear the error and attempt to cycle the machine.
		Clear the error and attempt to cycle the machine.
GUARDS NOT CLOSED	The manual cycle button was pressed while the guards were opened. This message refers to the guards included on the bench version of this machine. In this machine, the guard switch circuits are controlled by jumpers located in connector J2.	Check that the jumper is installed connecting positions 4 and 5 of J2. Also, check that the jumper is installed connecting positions 13 and 14 of J2. Verify that the contacts are fully seated in the connector.
		Clear the error and attempt to cycle the machine.
MOTOR FAULTED	The terminating machine detected a problem with the motor drive circuit.	Contact a Field Service Specialist.
MOTOR OVER TEMP	The motor temperature switch (located inside the fan shroud) has opened.	Check that the connector located on top of the fan shroud did not come off. Verify that contacts are fully seated.
		Check for overheating of the motor. Check and clean the filter screen and motor ventilation slots.
		Verify proper operation of the motor temperature switch—normally closed; opens at 49°C±3°C [120°F±5°F].
		The terminating machine <u>cannot</u> be cycled (the error will not clear) until the problem with the temperature switch is corrected.
MOTOR RELAY OPEN	The motor relay circuit (connected to parent interface connector J3) has opened.	Check for the proper seating of the contacts in connector J3. Make sure that the contacts in jumper positions 11 and 22 and 16 and 24 have not backed out of the housing.
		Reset the error and retry cycling machine.
SW 1 NOT UNMADE	During a normal cycle, the braking switch (SW 1) turns on and then is expected to turn off again. If by the end of the cycle SW 1 has not turned off, this error message is displayed. Check for proper alignment of the vane as it rotates through the switch. If the vane has struck the switch, it may need to be replaced.	With a voltmeter, electrically check the switch circuit in the following fashion: CAUTION: Do not disconnect the vane switch to perform this check. 1) With terminating machine power ON, check between contacts 1 and 2 of the vane switch connector—the reading should be between 22 and 24 Vdc. If no or low voltage is present, contact a Field Service Specialist. 2) With terminating machine power on, check between contacts 3 and 2 of the vane switch connector. Remove the rear cover so the pulley can be manually rotated. Allow the vane to move in and out of the gap of the switch under test. With no vane in the gap, the reading should be between .03 and .40 Vdc. With a vane in the gap, the reading should be between 22 and 24 Vdc.

Continues

PROBLEM	POSSIBLE CAUSE	REMEDY
SW 1 NOT MADE	During a normal cycle, the braking switch (SW 1) turns on and then is expected to turn off again. If by the end of the cycle SW 1 has not turned on, this error message is displayed.	Check for proper alignment of the vane as it rotates through the switch. If the vane has struck the switch, it may need to be replaced. Electrically check the switch circuit; see SW 1 NOT UNMADE.
SW 2 NOT MADE	During a normal cycle, the home switch (SW 2) turns on twice, passing through split cycle position and again at top dead center (TDC). If SW 2 was not seen turning on, this error message is displayed.	Check for proper alignment of the vane as it rotates through the switch. If the vane has struck the switch, it may need to be replaced. Electrically check the switch circuit; see SW 1 NOT UNMADE.
TEST CYCLE MODE	The terminating machine is in a special testing mode used during the manufacturing of the machine. Running the machine in this mode is not recommended.	To exit this mode, power down the terminating machine. Powering the machine back up will restore normal operation.
TESTING:	The terminating machine is in a special testing mode used during the manufacturing of the machine (see prior TEST CYCLE MODE). Running the machine in this mode is not recommended.	To exit this mode, power down the terminating machine. Powering the machine back up will restore normal operation.
WARN: GUARDS OPEN	Warns the operator that the guards are by-passed. This message refers to the guards included on the bench version of this machine. After bypassing the guards and the machine is in either the JOG mode Forward or JOG mode Reverse, when the guard is opened, this message is displayed. In this machine, the guard switch circuits are controlled by jumpers located in connector J2.	Check that the jumper is installed connecting positions 4 and 5 of J2. Also, check that the jumper is installed connecting positions 13 and 14 of J2. Verify that the contacts are fully seated in the connector.

9. REVISION SUMMARY

Revisions to this instruction sheet include:

- Changed company logo
- Removed Kit 679836-1, and modified Paragraph 3.2