Tyco Electronics

AMP-O-LECTRIC Servo Terminator (ST) III 1752200-[ ] (Used with the AMPOMATOR System III Leadmaker)

Customer Manual
409-10073
09 JAN 08 Rev B

customer manual

TOOLING ASSISTANCE CENTER 1-800-722-1111

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SAFETY PRECAUTIONS AVOID INJURY

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

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

- ALWAYS wear 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

1.1. AMPOMATOR System III Lead–Making Machine

The AMPOMATOR System III lead–making machine is an automated lead–making machine that yields finished terminated leads at high production rates. The machine uses miniature quick–change applicators, driven by servo terminators, to apply end– and side–feed terminals on automatically prepared wire.

The AMPOMATOR System III Machine is a combination of a Komax 433S OR 433L base machine with Tyco Electronics AMP–O–LECTRIC ST (servo terminators) and optional modules by various manufacturers. The base machine operating instructions binder contains information on the operation, preventative maintenance and adjustments pertaining to the Komax 433S or 433L base machine.

This manual contains information on operation, preventative maintenance, and adjustments of the overall AMPOMATOR System III machine. By default, screen shots captured in this manual show the 433S base machine. Although the 433L will appear different, it functions identically.

NOTE

Please be pay particular attention to the preface at the beginning of the base machine binder.

All information regarding the AMP–O–LECTRIC ST (servo terminator), and additions to TopWin, are covered in this manual. TopWin modifications are noted in the preface of the Base Machine Operating Instructions binder and further explained in this binder.

Optional equipment available for the AMPOMATOR System III machine is mostly documented in this binder, with the possibility of a few separately supplied documents. Available options documented in this binder include but are not limited to: Applicator Type Conversion Kits, Contact Carrier Cutter, Air Feed Assembly, Passive Scrap Collector, Terminal Lubricator Assembly, Terminal Reel Handling Assembly, Baseplate to Ram Adapter Alignment Gage, Shut–Height Gage, SLE Crimp Quality Monitor, and the Installation of the PAWO Seal Station. Other optional equipment (such as the wire marker systems) may be supplied separately.

This manual contains NOTE, CAUTION, and DANGER statements.

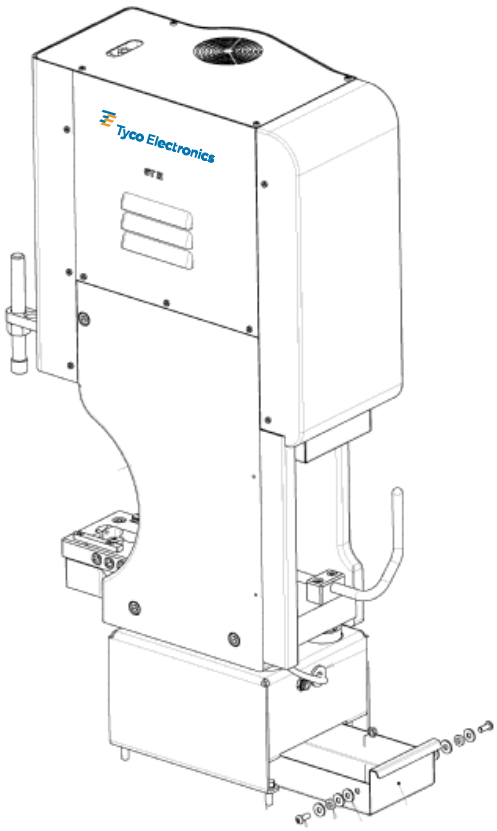


Figure 2

NOTE

Highlights special or important information.

CAUTION

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

DANGER

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

1.2. AMP–O–LECTRIC ST (Servo Terminator) III Machine (Figure 2)

The AMP–O–LECTRIC ST III machine is an “H” frame style servo terminator. Crimping force is produced with a servo motor coupled to a 10:1 gear reduction box. A crankshaft is mounted to the output of the gear box and drives the terminator ram. The ram stroke can be shortened by stopping short of top dead center and alternating rotational direction. Shut height is adjusted using a separate stepper motor driven axis. The entire terminator may be raised or lowered using another stepper motor driven axis.

The ram stroke length, crimp and terminator height are parameters that are stored with each defined terminal. All these adjustments will automatically return to the values stored for any specific terminal that is selected for production with minimal (if any) adjustment.

In most cases, applicators may be changed without tools. Refer to Paragraph 1,2,B for applicator types (and descriptions).

A. Servo Terminator Specifications

Capacity:	22,24kN [5000 lbf] maximum crimp force
Deflection:	0.137 mm [0.0054 in.] per 4,45kN [1000 lbf]
Noise:	74.9dB at 76 mm [3 in.] outside closed guard (Terminator only with standard mechanical feed applicator)
Weight:	Approximately 100kg [220 lb]
Air:	620–690 kPa [90–100 psi] 5,7 liters/minute [0.2 scfm] minimum for air feed applicators 8,5 liters/minute [0.3 scfm] for the scrap chopper
Height:	879 mm [34.6 in.] 937 mm [36.9 in.] with lift ring installed
Width:	231 mm [9.1 in.] 262 mm [10.3 in.] with optional Terminal Scrap Collector
Depth:	411 mm [16.2 in.] 518 mm [20.4 in.] with tonk arm
Electrical:	208–240VAC, 50/60 Hz, single phase, 1 amp, with ground
Temperature:	Ambient operating temperature range of 4°C to 40°C [40°F – 104°F]
Relative Humidity:	95% max. (non–condensing)
Strokes:	1.625” (full), 40 mm, 30 mm,
Shut Height:	135.788 mm at 8007 kN [5.3460 in. at 1800 lbs] (AMP HDM) 119.500 mm at 8007 kN [4.7047 in. at 1800 lbs] (JAM)
CH Adj. Range:	0,5 mm looser / 3,5 mm tighter [0.02” looser / 0.14” tighter]
Height Adj. Range:	25,5 mm [1.00 in.]

B. Applicator Types

The AMPOMATOR System III machine is designed to accommodate a wide variety of terminal and applicator styles. If you have an application that is not listed below, contact Tyco Electronics for assistance.

The following list is organized according to the standard configurations for which the ST may be ordered.

AMP HDM

Servo Terminators 1752200–1 (with/SLE CQM) are primarily intended for AMP HDM Mechanical and Air End–Feed and Side–Feed style applicators. (Also included are the System III Servo Feed Applicators.) These include unusual AMP HDM’s (heavy duty miniature) applicators such as:

- Ultra–Pod Applicators
- Ultra–Fast Applicators
- Hingebar Applicators
- Bench Tape Feed Applicators (A conversion kit must be ordered for this applicator type)

NOTE

These terminators are not capable of quickly switching between AMP HDM style and other applicator styles. The AMP HDM+ series was designed for quick applicator style conversions.

NOTE

Although Bench Tape Feed type applicators may be used on the AMP–O–LECTRIC ST , they require a hex wrench to load/unload in/out of a servo terminator. Additionally, the carrier tape is directed back towards the terminal inlet. Operator attention is required to avoid having the exiting carrier tape interfere with production. Therefore, Leadmaker Tape Feed applicators are recommended instead of bench tape feed applicators.

JAM

Servo Terminators 1752200–3 (with/SLE CQM) are intended for JAM style Mechanical and Air End–Feed & Side–Feed type applicators only.

NOTE

These terminators are not capable of quickly switching between JAM style and other applicator styles. The AMP HDM+ was designed for quick applicator style conversions.

AMP HDM+

Servo Terminators 1752200–5 (with/SLE CQM) have an AMP HDM+ ram adapter that is capable of quickly changing between AMP HDM, JAM and Delphi Mechanical and air end–feed and side–feed style applicators. (Also included are the System III Servo Feed Applicators.) As received, these terminators come ready to run AMP HDM style applicators. These include unusual AMP HDM's such as:

- Ultra–Pod Applicator
- Ultrafast Applicator
- Hingebar Applicator
- Bench Tape Feed Applicators (A conversion kit must be ordered for this applicator type)

With conversion kits, quick changes can be made between JAM, Delphi, and AMP HDM style applicators.

NOTE

Although Bench Tape Feed type applicators may be used on the AMP–O–LECTRIC ST, they require a hex wrench to load/unload in/out of a servo terminator. Additionally, the carrier tape is directed back towards the terminal inlet. Operator attention is required to avoid having the exiting carrier tape interfere with production. Therefore, Leadmaker Tape Feed applicators are recommended instead of bench tape feed applicators.

C. AMP–O–LECTRIC ST III Keypad

The AMP–O–LECTRIC ST keypad consists of a membrane switch on the terminator which acts as an interface between the operator/setup person and the terminator. The keypad on the terminator appears as shown in Figure 3.

Figure 3

 — Apply Button.

 — Cancel Button

The confirm (hand icon) button, located below the monitor enables the safety circuit and allows mechanisms to be moved with the guards open. This button must be pressed and held prior to pressing any button (except the Apply and Cancel buttons) on the keypad.

The mechanisms must be in their programmed position prior to running the machine.

The Apply/Cancel indicator is normally off. It will flash slowly when an adjustment has been made and needs to be applied or cancelled. The Apply/Cancel indicator will go off when either button is pressed. The mechanism will not move when either button is pressed.

NOTE

There are duplicate Apply/Cancel buttons on the monitor that function the same as the Apply/Cancel buttons on the keypad.

Indicators

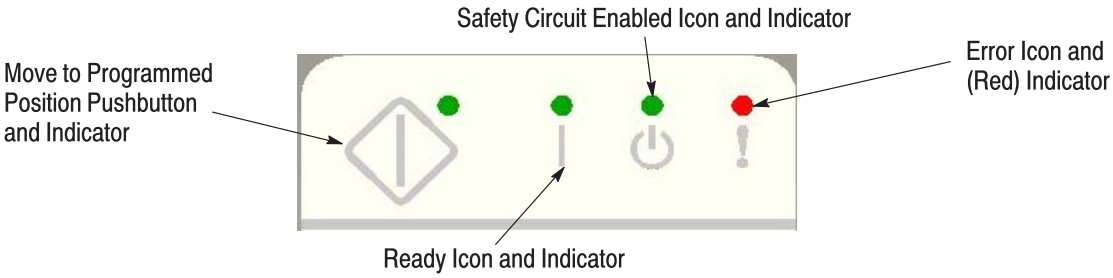
Mechanism indicators will be illuminated when that mechanism is in its Programmed Position. Mechanism indicators will flash slowly along with the Programmed Position indicator when that mechanism is in a calibration mode. The mechanism indicator will flash slowly along with the Apply/Cancel indicator when that mechanism has been moved from its programmed position. The mechanism indicator will turn “on” when Apply is pressed and go “off” if Cancel is pressed.

CAUTION

The mechanisms will automatically move to their programmed positions when the guards are closed.

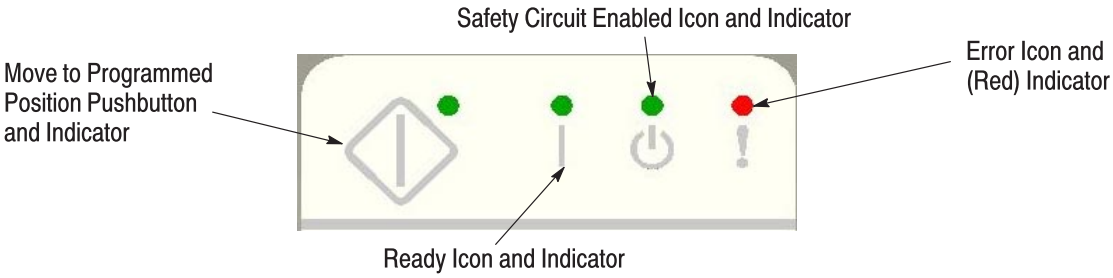
A message will be displayed to warn the operator that the terminal may be out of position due to returning the mechanisms (ram and/or feed) to their programmed positions.

Above the Top Line of the Keypad



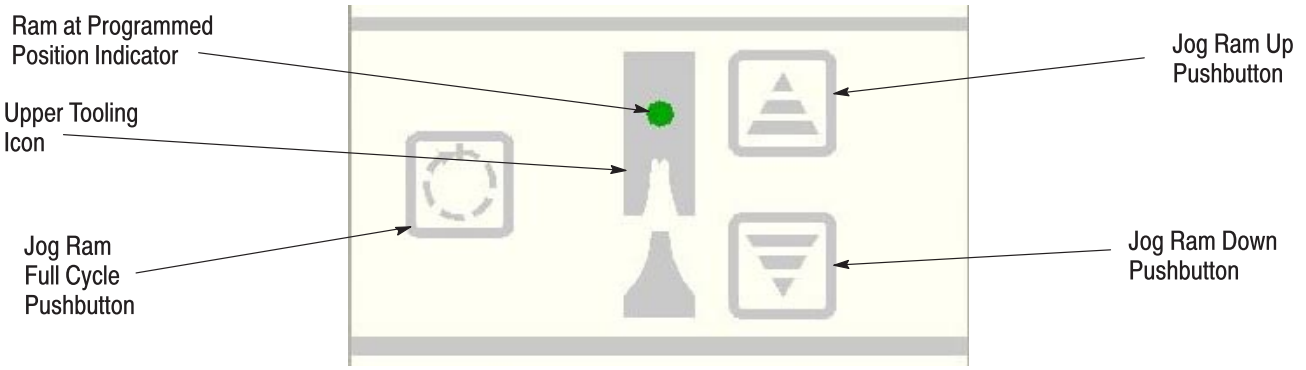
ICON/INDICATOR	DESCRIPTION
Move to Programmed Position Button (and Green Indicator)	This is used to move all of the terminator mechanisms to their programmed positions, to clear errors, and to exit calibration or setup modes. This button operates as follows: a. The indicator is normally turned off. b. The Move To Programmed Position button will only operate when the Confirm button is pressed. c. When the Move To Programmed Position button is pressed and held, the indicator will flash rapidly until all moves are completed. At which time it will be turned off and the button may be released. d. To clear an error, press and hold this button until the indicator turns off. e. If the Move To Programmed Position button or Confirm button are released too soon, the red Error indicator will illuminate. The buttons may be pressed and held again to complete the movement. f. The indicator will be flashing if a different article is specified. Pressing and holding the Move To Programmed button will move the ram and the terminator height to the programmed positions, at which time the indicator will be turned off and the indicator in the second and fourth sections will be on. g. The indicator will be flashing if a different article is specified and a System III applicator is installed that contains the proper program. Pressing and holding the button will move the ram, the terminator height and the feed mechanism to their programmed positions at which time the indicator will be turned off. The indicator in the second and fourth sections will be on. Additionally, one of the two indicators in the third section of the keypad will be “on” indicating that the feed mechanism is at its programmed position. The button may now be released.
Ready Icon and Indicator	This is represented by a READY ON icon (straight line). Shortly after power is supplied to the terminator the indicator will light.
Safety Circuit Enabled Icon and Indicator	This icon is represented by a “stand-by” icon. An “on” indicator means the terminator is able to be run and that the keypad is active. This indicator is on when the guards are closed ***or*** when the Confirm button is pressed with the guards open. The Confirm button must be pressed and held prior to pressing any button (except the Apply and Cancel buttons) on the keypad.

Above the Top Line of the Keypad



ICON/INDICATOR	DESCRIPTION
Error Icon and (Red) Indicator	This icon and red indicator indicates that there is a terminator movement error when it is flashing rapidly and a programming error when on. This will be accompanied by a rapidly flashing green indicator (in one of the lower keypad areas) that will indicate the mechanism at fault. This may be caused by the following conditions: a. The terminator did not reach its programmed position or was unable to move while being jogged. (The Error indicator will rapidly flash and the Ram at Programmed Position indicator will rapidly flash). b. The Feed mechanism did not reach its programmed position or was unable to move while being jogged (Error indicator rapid flash and Feed Finger Extended or Feed Finger Retracted indicator rapid flash). c. The System III applicator and machine article do not match (Error indicator on and Feed Finger Extended and Feed Finger Retracted indicators rapid flash). d. The System III applicator is not programmed (Error indicator on and Feed Finger Extended and Feed Finger Retracted indicators rapid flash). e. The terminator height adjustment did not reach its programmed position, was unable to move while being jogged or moved beyond its allowable range of adjustment. (The Error indicator will rapidly flash and Terminator at Programmed Height indicator will rapidly flash). f. Any terminator error where the main drive motor or crimp height adjustment motor is unable to reach its desired position. (The Error indicator will rapidly flash and appropriate mechanism indicator will rapidly flash). g. The Confirm button was released prior to completion of a movement. (The Error indicator will rapidly flash and the appropriate mechanism indicator will rapidly flash).

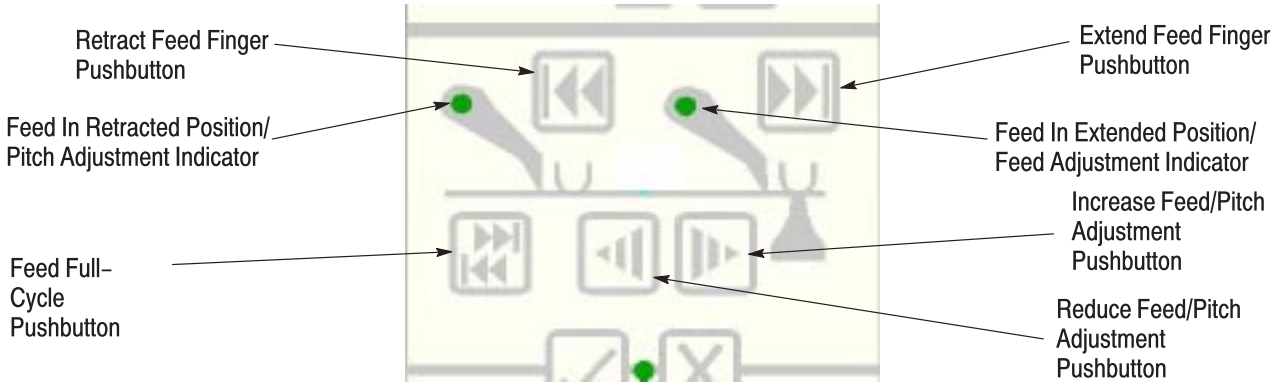
BETWEEN THE FIRST TWO LINES



ICON/INDICATOR	DESCRIPTION
Ram at Programmed Position Indicator	This indicator is located in the center of the upper tooling icon. It will be lit when the ram is in its programmed position and will flash slowly when the ram is not at its programmed position.
Jog Ram Up Pushbutton	This pushbutton is used to raise the ram intermittently at a reduced rate.
Jog Ram Down Pushbutton	This pushbutton is used to lower the ram intermittently at a reduced rate.
Jog Ram Full Cycle	This pushbutton is used to jog the ram intermittently through a complete crimp cycle.

The ram can be returned to the top position by pressing the Jog Ram Full Cycle pushbutton (or the Jog Ram Up Pushbutton) ***or*** the Move To Programmed Position button while holding the Confirm button.

BETWEEN THE SECOND AND THIRD LINES



NOTE

** The "confirm" pushbutton must be depressed (additionally) for any of the following motions to occur, except where noted.*

NOTE

This section applies primarily to the System III Servo Feed Applicators. The "Feed Full Cycle" pushbutton is the only button that pertains to standard air-feed applicators.

ICON/INDICATOR	DESCRIPTION
Retract Feed Finger Pushbutton	Pressing and holding this pushbutton moves (retracts) the feed to the programmed position.
Extend Feed Finger Pushbutton	Pressing and holding this pushbutton moves (extends) the feed to the programmed position.
Feed In Retracted Position/Pitch Adjustment Indicator	This indicator lights when the feed finger is retracted. In this position, the feed pitch may be adjusted. See Note 1 and Note 3 below.
Feed In Extended Position/ Feed Adjustment Indicator	This indicator lights when the feed finger is extended. In this position, the terminal feed position over the anvil may be adjusted. See Note 1, Note 2, and Note 3, below.
Increase Feed/Pitch Adjustment Pushbutton * Confirm not required	If at the feed in extended position, holding this button will extend the terminal feed position over the anvil. If at the feed retracted position, holding this button will shorten the feed pitch. Adjustments will be lost unless "accepted" before using other motion buttons (except the Reduce Feed /Pitch Adjustment Pushbutton.) Refer to Note 1 below.
Reduce Feed/Pitch Adjustment Pushbutton * Confirm not required	Holding this pushbutton (at the feed in extend position) will reduce the terminal feed position over the anvil. Holding this pushbutton (at the feed retracted position) will lengthen the feed pitch. Adjustments will be lost unless "accepted" before using other motion push buttons (except the Increase Feed / Pitch Adjustment Pushbutton.) Refer to Note 1 and Note 2 below.
Feed Full-Cycle Pushbutton	Pressing and holding this pushbutton will run a complete (full) cycle at normal speed.

NOTE 1

When adjusting the terminal feed position over the anvil, the distance between the extended and retracted feed finger positions (the feed pitch) does not change. So, changing the extended feed finger position automatically adjusts the retracted feed finger position by the same amount. When adjusting the feed pitch, the terminal feed position over the anvil does not change.

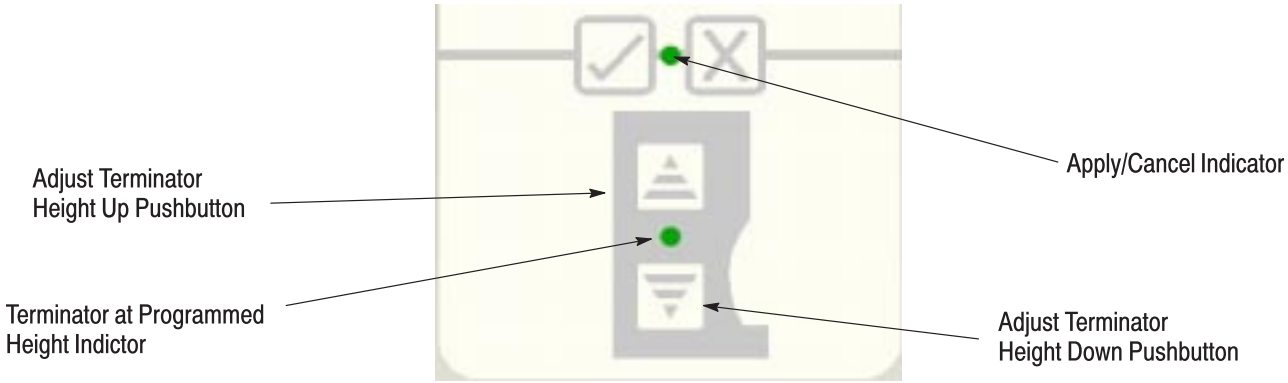
NOTE 2

The terminal position will not change when reducing the terminal feed position over the anvil. To see where the terminal will be located over the anvil, the terminal drag may be released and the strip retracted to contact the feed finger. Be sure to engage the terminal drag after completing the feed adjustment.

NOTE 3

Both the Feed In Retracted Position Pitch Adjustment Indicator and the Feed In Extended Position / Feed Adjustment Indicator will blink when different applicator is installed. This indicates that setup information is being exchanged. Do NOT attempt to make adjustments until the blinking has completed, or an error will occur.

LOWER AREA



ICON/INDICATOR	DESCRIPTION
Adjust Terminator Height Up Pushbutton	The terminator height is adjusted up. (Adjustments will be lost unless “accepted” before using other motion push buttons.)
Adjust Terminator Height Down Pushbutton	The terminator height is adjusted down. (Adjustments will be lost unless “accepted” before using other motion push buttons.)
Terminator at Programmed Height Indictor	The Terminator at Programmed Height indicator will flash slowly when the terminator height is moved from the programmed position. If the terminator is unable to move to its programmed position or is moved past the travel limits, the Error indicator and the Terminator at Programmed Height indicator will flash rapidly.
Apply/Cancel Indicator	The Apply/Cancel indicator is normally off. A flashing indicator indicates an adjustment was made from the programmed position. The new position must be applied or canceled (with the appropriate pushbutton) prior to adjusting another mechanism or running production. After the new position is either applied or canceled the indicator will turn off. The Move To Programmed Position button may be used to move to the programmed position after the Cancel pushbutton button is pressed.

NOTE

The indicator will be off when a different System III applicator is first installed in the terminator. See the first section for information on initiating the terminator adjustment.

OTHER TERMINATOR INDICATIONS

CONDITION	DESCRIPTION OF INDICATORS
Indicator Operation During Calibration	The Move To Programmed Position button is used to exit all of the calibration modes.
Top Dead Center Indication	The Ram at Programmed Position indicator and Move To Programmed Position indicator will flash slowly during TDC calibration. This is an automated calibration that takes several minutes and must be completed with the guards closed. The screen will display a message when the calibration is complete.
Shut Height Indication	The Ram at Programmed Position indicator and Move To Programmed Position indicator will flash slowly while in this mode. While in this mode the full cycle button will move the ram through BDC two times and then stop. The Ram at Programmed Position indicator will flash rapidly while the ram is moving through its cycle. The cycle is completed when the indicator returns to the slower flash cycle. Adjustments are made in .0005" increments by pressing the Jog Ram Up or Jog Ram Down buttons on the right side of the keypad. Press the Apply pushbutton to save the new shut height.
Blase Plate to Ram Adapter Alignment Indication	The Ram at Programmed Position indicator and Move To Programmed Position indicator will flash slowly while in this mode.
Vertical Height Indication	The terminator icon indicator and Move To Programmed Position indicator will flash while in this mode. Click the Apply button to save the vertical height.

D. AMP–O–LECTRIC ST III Specific Software

The Tyco Electronics ST terminator operation is fully integrated into the operation of the base leadmaker. It also has convenient local controls on a membrane keypad. The operation of the terminator for setup, diagnostics, and running production is performed with a combination of the graphical user interface hosted by TopWin operating system and the integrated membrane keypad. The terminator is available with the SLE crimp quality monitor system. Please refer to separate manual sections for operation of these systems.

Paragraph 4,1 describes the functionality of the various screens and dialogs that appear on the TopWin operating system. Detailed process instructions, such as certain calibration procedures, are defined in greater detail in other sections of the customer manual.

The following buttons are typical to most all of the operation screens:

NOTE

*The **Accept** and **Cancel** buttons will only appear if a value or selection has been changed on the screen.*

Accept: Allows you to accept any changes that you have selected on the screen.

Cancel: Allows you to cancel any changes that you have made. Previous settings and parameters will re–appear.

Defaults: Sets all fields to their default values or selections.

Exit: Exits the screen.

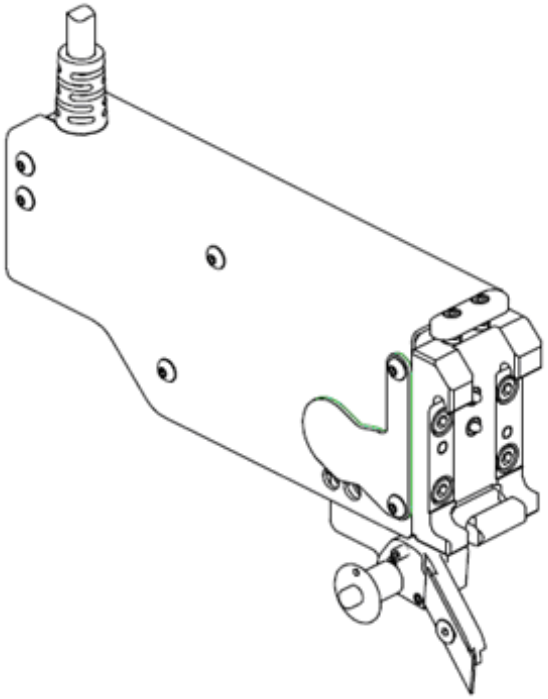
1.3. System III Servo Terminal Feeder (Figure 4)

The System III Servo Terminal Feed Assembly is used in conjunction with the AMPOMATOR System III leadmaker equipped with System III Servo Terminators, and System III applicators to provide the means for feeding terminals into the applicator for crimping.

The assembly consists of a feeder assembly with detachable feed fingers for side and end feed terminals, a servo amplifier, an integration wire harness, and miscellaneous hardware.

NOTE

Optional Feeder Calibration Block 1901063-1 is recommended.



System III Servo Terminal Feeder (1901060-1) Specifications	
Weight:	1.66 kg [3.67 lb]
Length:	206 mm [8.1 in.]
Depth:	51 mm [2.0 in.]
Height:	102 mm [4.0 in.]
Electrical:	Supplied by the System III Servo Terminator
Temperature:	4 to 40° C [40 to 104° F]
Relative Humidity:	95% Maximum non-condensing
Stroke:	42 mm [1.66 in.] maximum
Speed:	300 mm/sec max [11.8 in./sec max]
Adjustment Increment:	0.020 mm [0.0008 in.]

Figure 4

2. PRODUCTION OPERATION / PRODUCTION SETUP

2.1. Applicator Installation

This section describes the installation of AMP HDM, JAM, and Delphi, and System III type applicators. Refer to Figures 5, 6, and 7 and 10 for illustrations of the applicators.

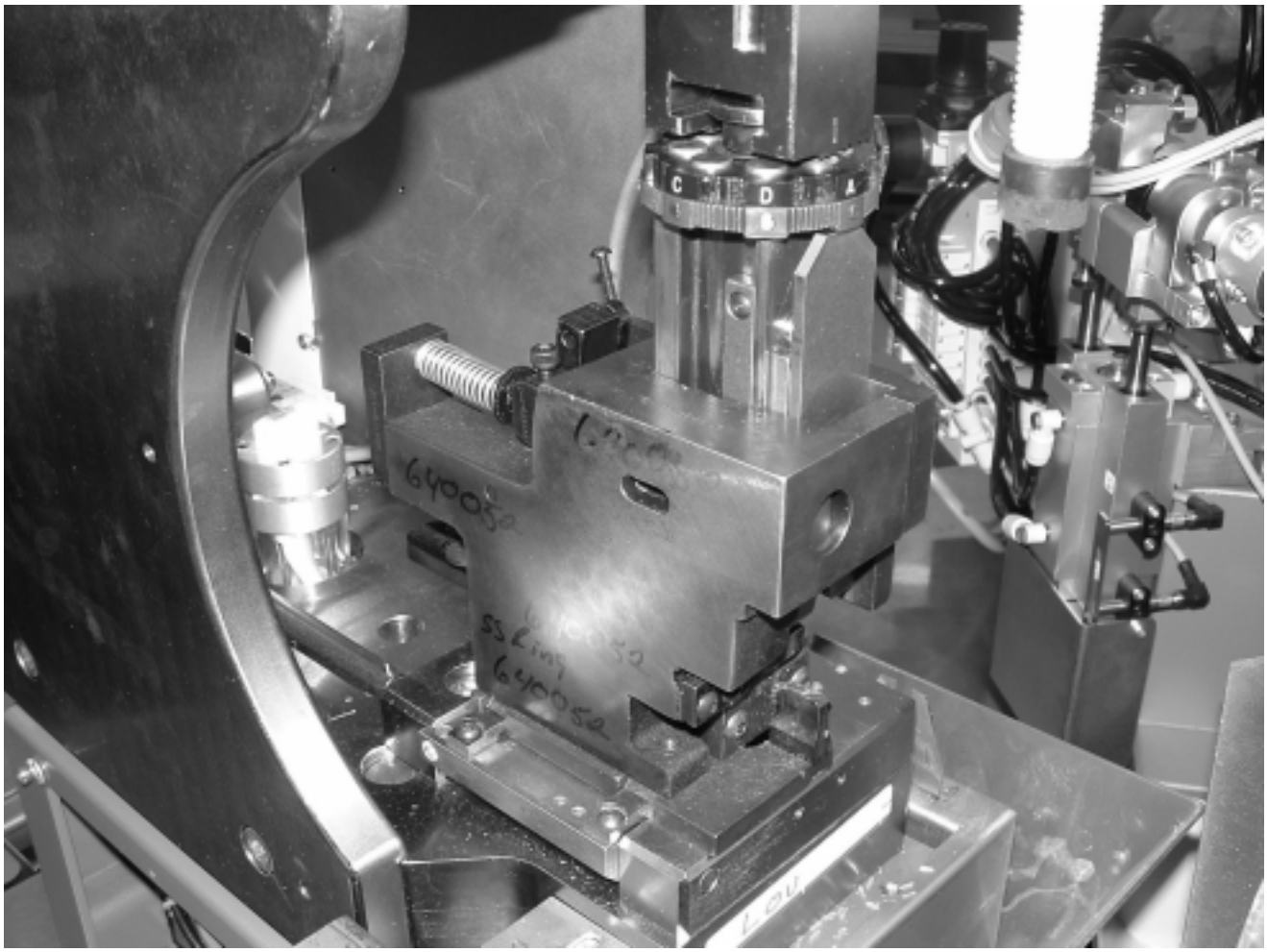


Figure 5 — AMP HDM Style Applicator

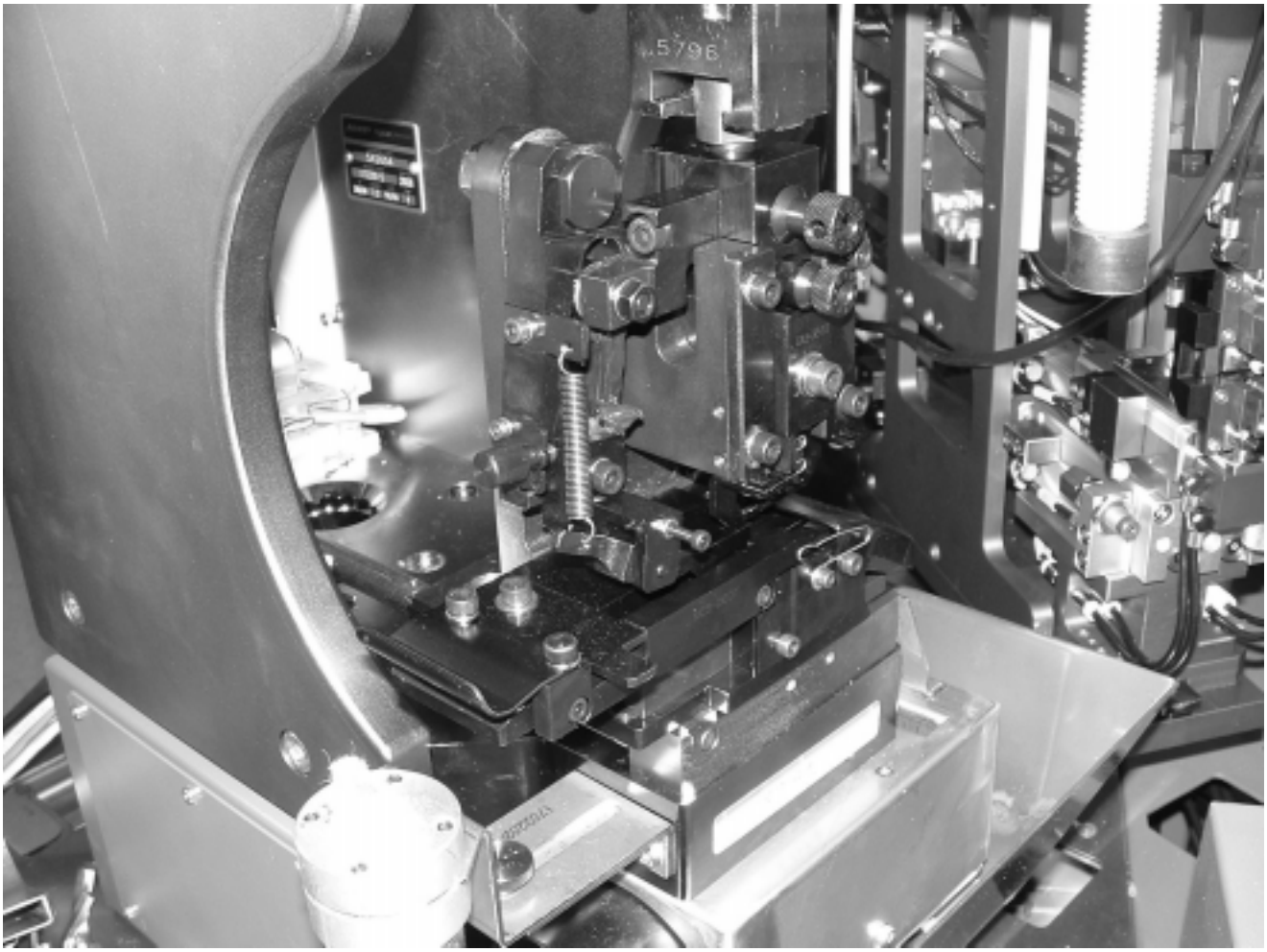


Figure 6 — JAM Style Applicator

Applicators are self–contained units that are designed to apply specific terminals. Applicators for open–barrel and closed–barrel terminals generally contain stationary lower tooling and movable upper tooling. However some applicators (slide applicators) for closed–barrel terminals contain movable lower tooling.

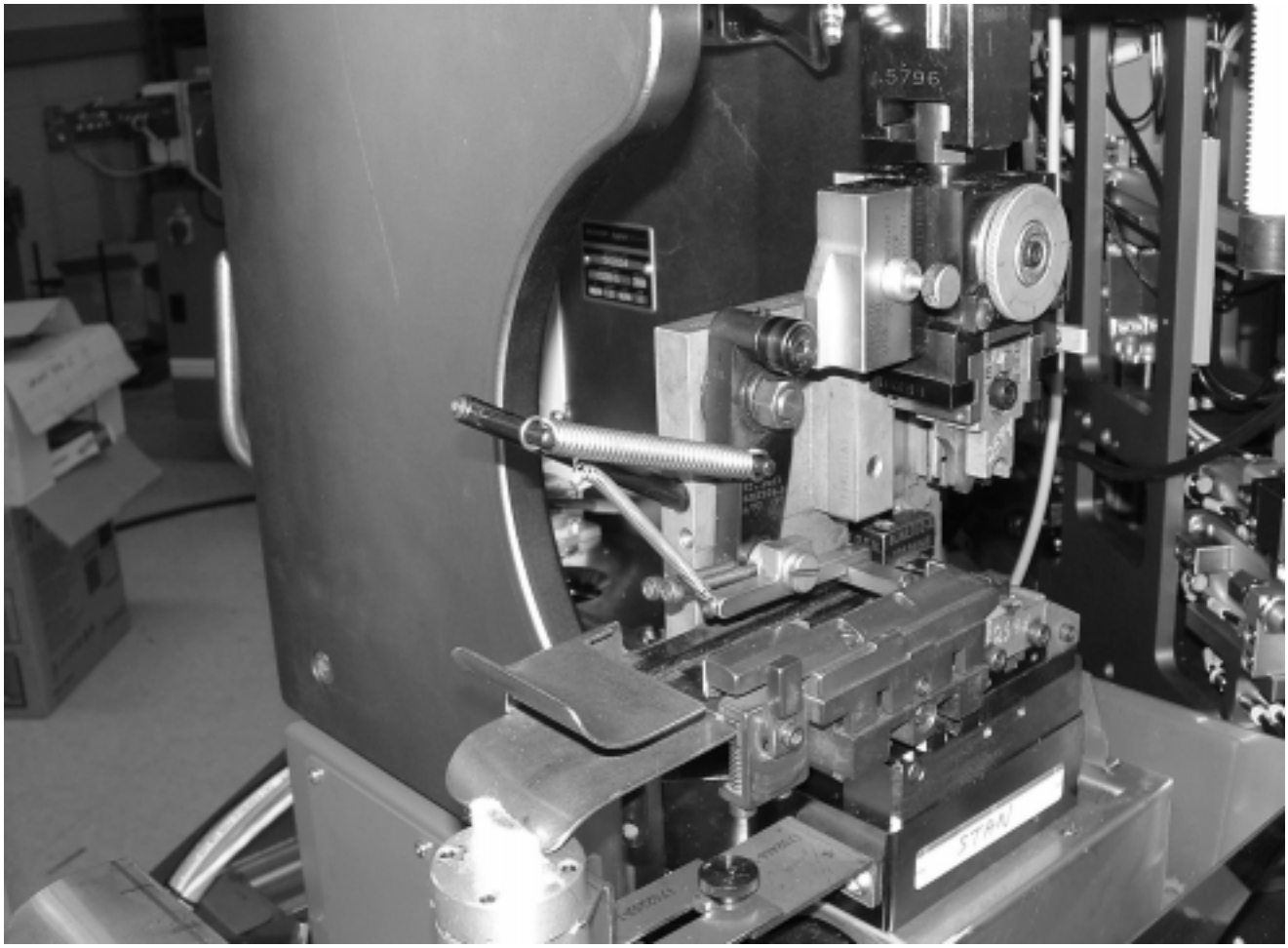


Figure 7 — Delphi EZ Pack

To install AMP HDM (Heavy Duty Mini) applicators, System III Applicators, Ultrafast AMP HDM applicators, JAM applicators, and Delphi–style applicators, proceed as follows:

DANGER

To avoid personal injury, an emergency stop button must be pressed to turn off machine power. Accidentally restarting the machine could activate the cycling of machine mechanisms, resulting in injury.

1. On a System III applicator, attach the feeder and dress the cable out of the way of incoming product.
2. Couple the applicator ram to the terminator ram adapter.
3. Close the latches. Check to make sure the latches are aligned and fully engaged with the applicator baseplate.

NOTE

Some Ultrafast AMP HDM applicators require reconfiguring the moving latches. Refer to the 1901578 conversion kit assembly drawing for details.

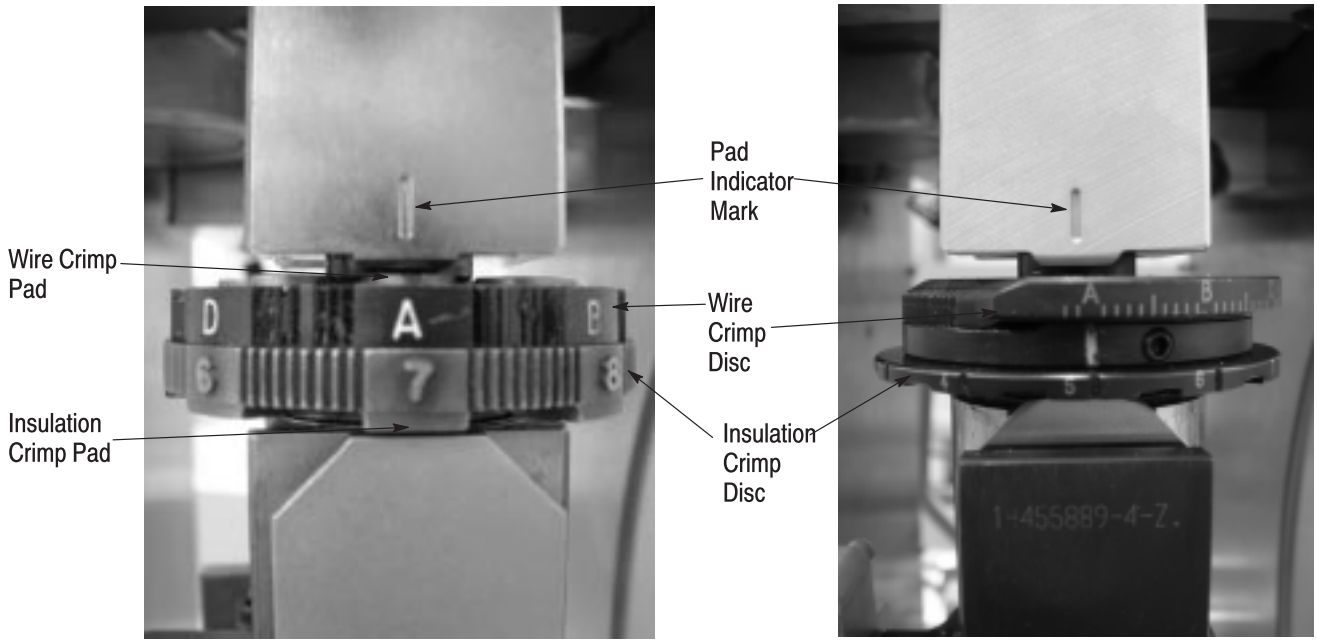
4. Refer to the instruction sheet for the 1752440–[ ] assembly (408–10097) for threading terminals to the applicator.
5. If equipped, refer to the 408–10096 and adjust the optional Terminal Lubricator Assembly.
6. Set the wire crimp and insulation crimp discs so that the letters and numbers align with the mark above the front pad on the ram adapter post. See Figure 8. For all applicators with adjustable wire crimp

heights, adjust to the highest crimp height (pad “A” for AMP HDM and AMP Fine Adjust System III applicators) and allow the terminator to regulate the crimp height. Set the insulation crimp height as desired.

CAUTION

Installing an applicator with the crimp height set to any thing less than the highest crimp height may result in tooling damage.

7. Refer to the applicator instruction sheet for applicator–specific setup information. Also, verify that the applicator matches the terminal to be applied.



AMP HDM Applicator *AMP Fine Adjust System III Applicator*

Figure 8

8. Select the appropriate stroke length for the applicator. The default stroke length for the terminator is 1 5/8 inches (full stroke).

– AMP HDM applicators are either 1 5/8 inch stroke or 1 1/8 inch stroke.
– Most JAM applicators are 30 mm stroke applicators.
– Most Delphi and some European applicators are 40 mm stroke applicators.

Once set, the stroke length is stored with the terminal data.

CAUTION

Running a short stroke applicator at full stroke may damage the applicator or baseplate. If the stroke length is unknown, begin with a 30 mm stroke length. If terminal feed problems occur, a longer strokemay need to be selected.

NOTE

Although a 1 1/8 inch AMP HDM may work with a 30 mm stroke, it is recommended that the applicator be converted to 1 5/8 inch stroke. Refer to the applicator assembly drawing for feed cam conversion details.

9. The applicator can be cycled at a reduced “jog” speed to verify proper operation.

Install air–feed applicators as described previously, with the following exceptions:

- There will be at least one pneumatic connection. Refer to 408–10089 for connection and software settings information.

- Air–feed applicators must have the optional air feed valve installed on the terminator. If this option is not already installed, order Kit 1752470–1. To install it, follow the instructions in 408–10089.
- In addition to the Air Feed Valve Kit, AMP HDM air–feed applicators require Quick Disconnect Kit 1752471–1. AMP HDM Ultra–Pod applicators require Quick Disconnect Kit 1752471–2. To install these kits, follow the instructions in 408–10089.

NOTE

*AMP HDM Ultra–Pod applicators that are **not** set up to run on Komax leadmakers will need Air Valve Conversion Kit 1633069–[ ] and Tonk Kit 1–509538–7.*

NOTE

On older AMP HDM air–feed applicators it may be necessary to remove the air feed cylinder, rotate it 90 degrees and re–install it to avoid air fitting interference.

To install AMP HDM Bench Tape–Feed Applicators, proceed as follows:

1. Couple the applicator ram to the terminator ram adapter.
2. Engage the stationary “T” shaped clamp with the applicator baseplate.
3. Using a 3 mm hex wrench, install the stationary “T” clamp to the terminator baseplate. See Figure 9

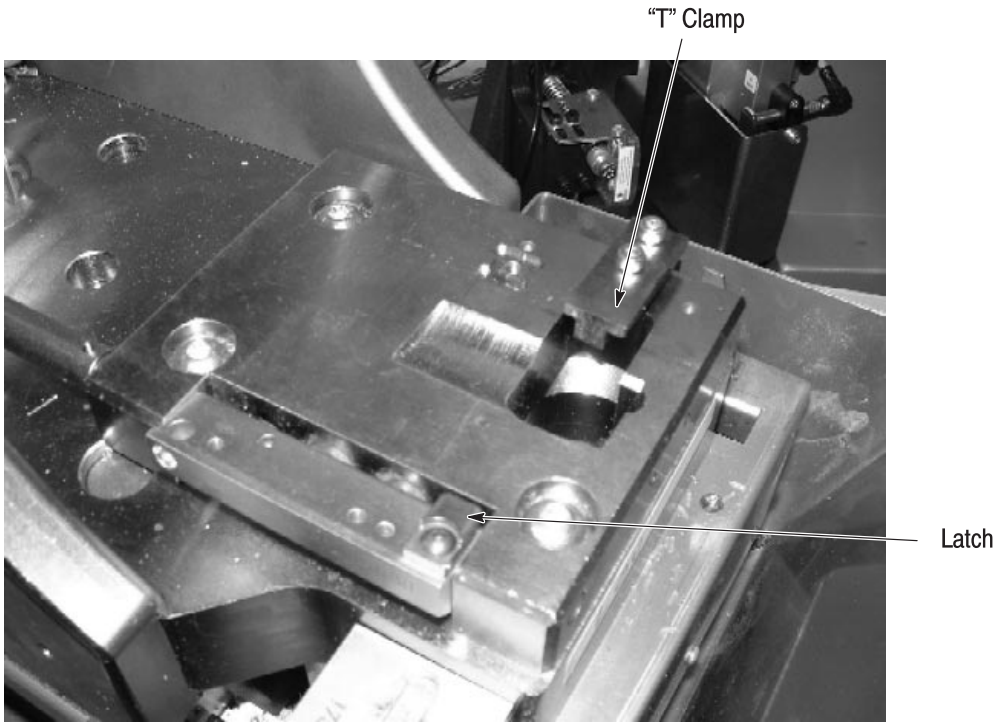


Figure 9

4. Close the latch. Check to make sure the latches are aligned and fully engaged with the applicator baseplate.
5. Refer to the instruction sheet (408–10097) for the 1752440–[ ] assembly for threading terminals to the applicator.
6. Set the wire crimp and insulation crimp discs so that the letters and numbers align with the mark above the front pad on the ram adapter post. See Figure 8. For all applicators with adjustable wire crimp heights, adjust to the highest crimp height (pad “A” for AMP HDM applicators and AMP Fine Adjust

System III applicators) and allow the terminator to regulate the crimp height. Set the insulation crimp height as desired.

CAUTION

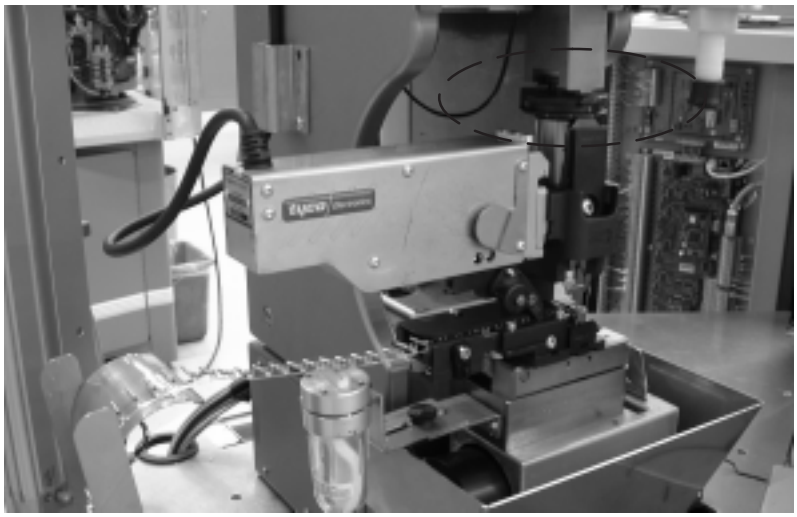
Installing an applicator with the crimp height set to any thing less than the highest crimp height may result in tooling damage.

7. Refer to the applicator instruction sheet for applicator specific setup information. Also, verify that the applicator matches the terminal to be applied.

8. The default for the terminator stroke is 1 5/8 inches (full stroke). This setting is stored with the terminal data.

9. The applicator can be cycled at a reduced “jog” speed to verify proper operation.

Non–Adjust System III Applicator (No Wire Crimp Height Adjustment)



Fine Adjust System III Applicator

Figure 10

2.2. System III Servo Terminal Feeder –– Basic Operation

NOTE

The following procedure assumes that terminals have been setup and loaded in TopWin.

1. Attach the appropriate feed finger to the terminal feeder using the quick–release pin.

NOTE

The required feed finger is identified on the applicator identification tag and in the data storage device on the applicator (the data can be displayed though the software in the leadmaker).

Figure 11 shows the side feed finger assembly and Figure12 shows the end–feed finger assembly. Note that the side–feed finger features a replaceable tip that can be flipped over to provide an additional feed tip.

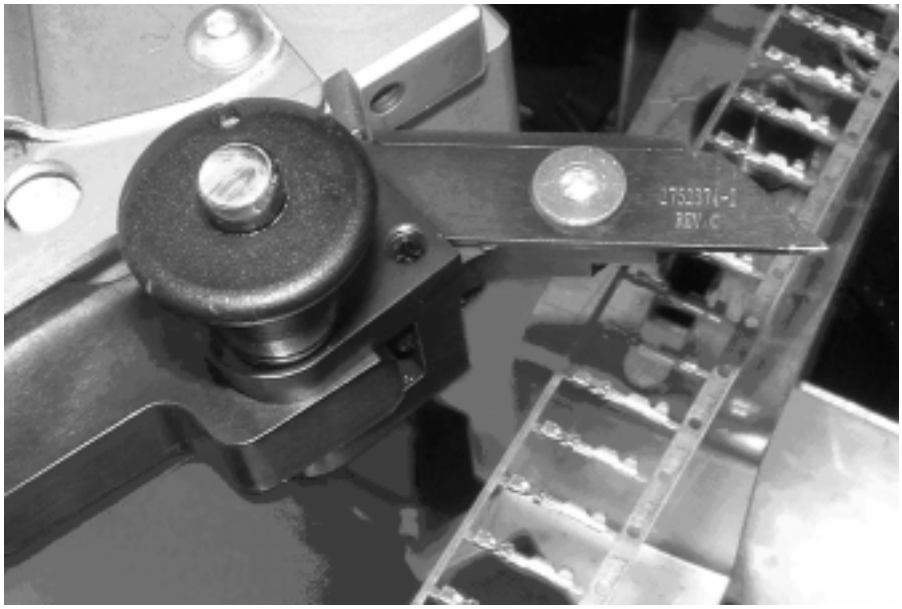


Figure 11

Figure 12

2. Load the applicator into the terminator.
3. Flip the side–feed finger into the “up” position. A spring–loaded detent will hold it in place.

4. Install the feeder into the applicator as shown in Figure 13. Flip the feed finger down, making sure that the feed finger is positioned in the feed–track groove with side–feed applicators. (Refer to Figure 14.)

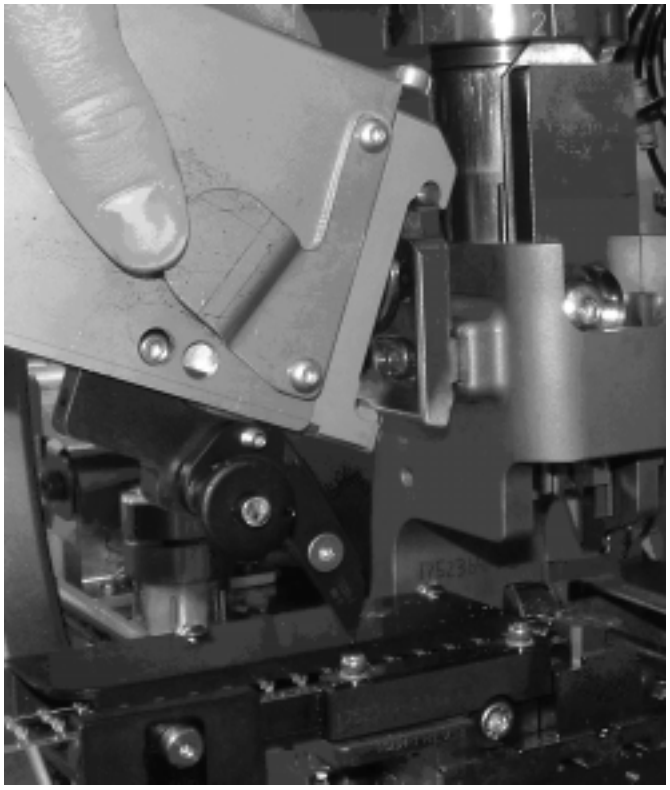


Figure 13

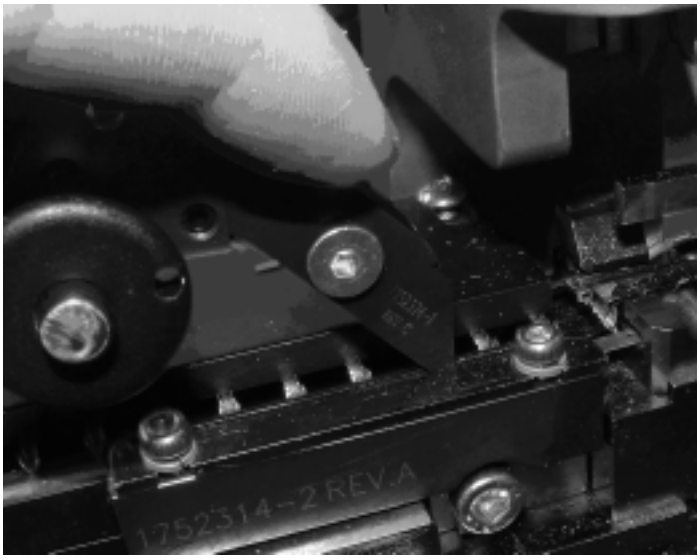


Figure 14

NOTE

The feeder may be installed with the terminal strip loaded, as shown in Figure 13, Figure 14, and Figure 15.

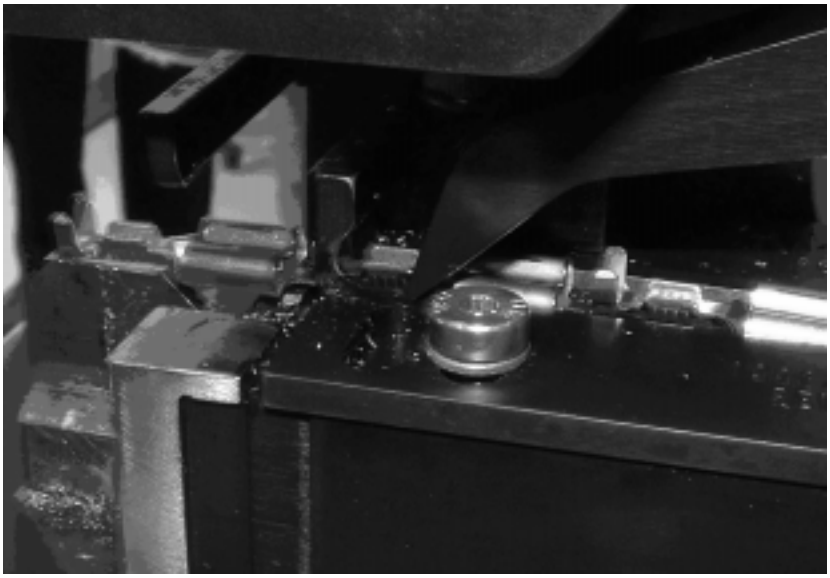


Figure 15

5. After the feeder is attached, the “Feed Finger Extend,” “Feed Finger Retract,” and “Ram–to–Program Position” indicators will flash — indicating that data is being uploaded from (or downloaded to) the applicator. Removal of the feeder unit during uploading or downloading data will result in an error and lost data.

2.3. Article Definition and Adjustment

A. Article Setup

NOTE

Refer to the “TopWin” Software Manual, Article # 0025358 for details and screen shots.

TopWin operates under the premise of articles. An article is made up of requirements needed to produce the product. Such requirements can be terminal specific, or wire specific. In addition, options such as wire doubling, terminal seals, and tinning are all classified as article requirements.

The following section covers only the mandatory requirements of an article to begin production. Refer to to the Komax manual for additional details

Creating, Saving, and Opening Articles

1. Select “New” from the “Article” pull down tab. This clears all existing terminal and wire–specific settings and prepares for a new setup.

2. Select “Save” or “Save As” from the “Article” pull down tab to save changes made to the article.

3. Select “Open” from the “Article” pull down tab to recover any saved articles.

Wire Selection and/or Setup

1. Using the “Setup” tab in TopWin, left click the wire feed diagram on the machine layout image to open the wire selection window.

2. Select an existing wire from the list or press the “Copy/New” button to create a new wire. See Figure 16.

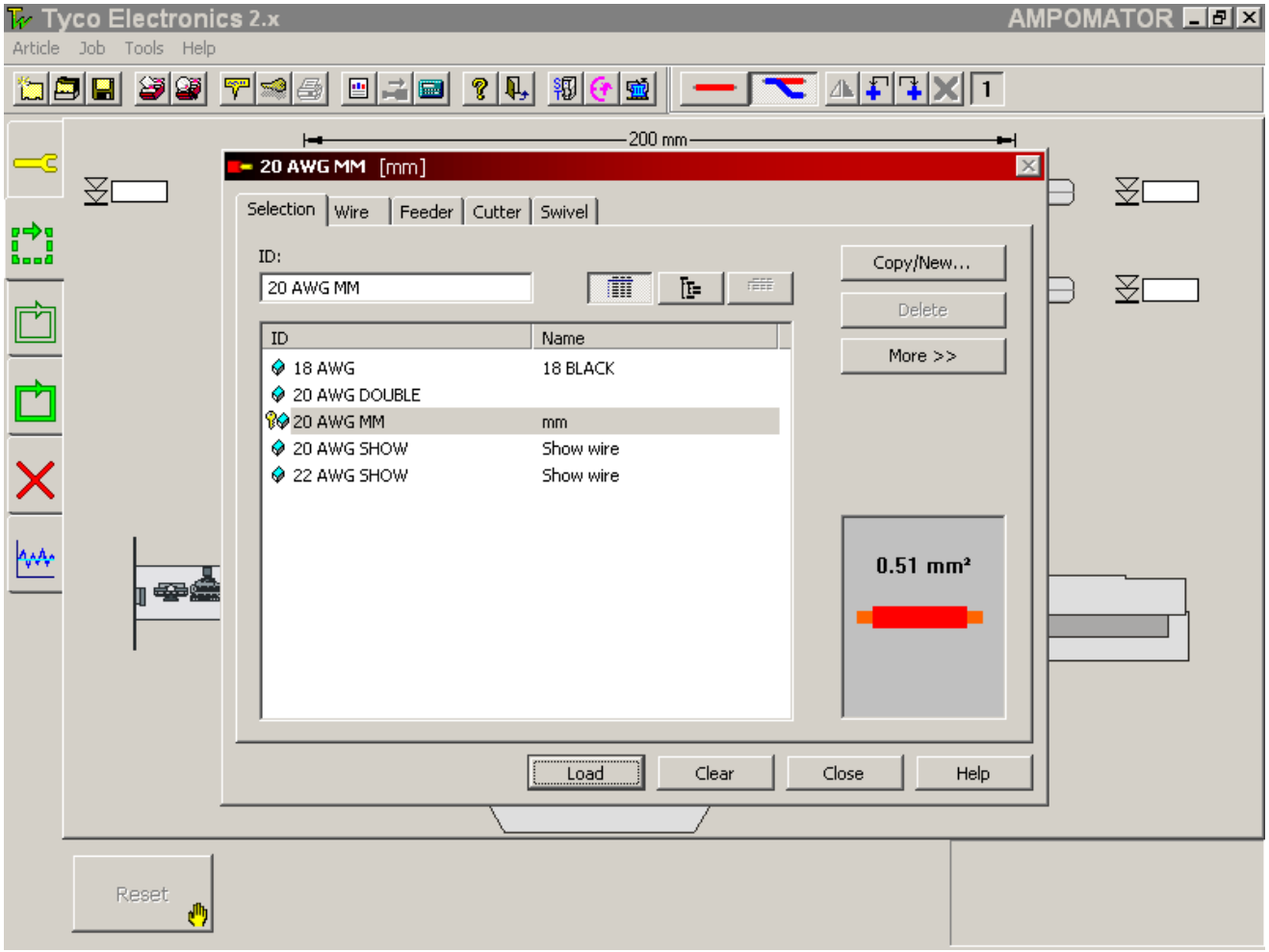


Figure 16

3. Enter a name for the new wire.
4. Then select “OK.”
5. Next select the wire cross section under the “Wire” tab. The core diameter and insulation diameter will automatically adjust to the correct default settings. See Figure 17.

Additional settings for the feed, cutter, and swivel can also be set in this window.

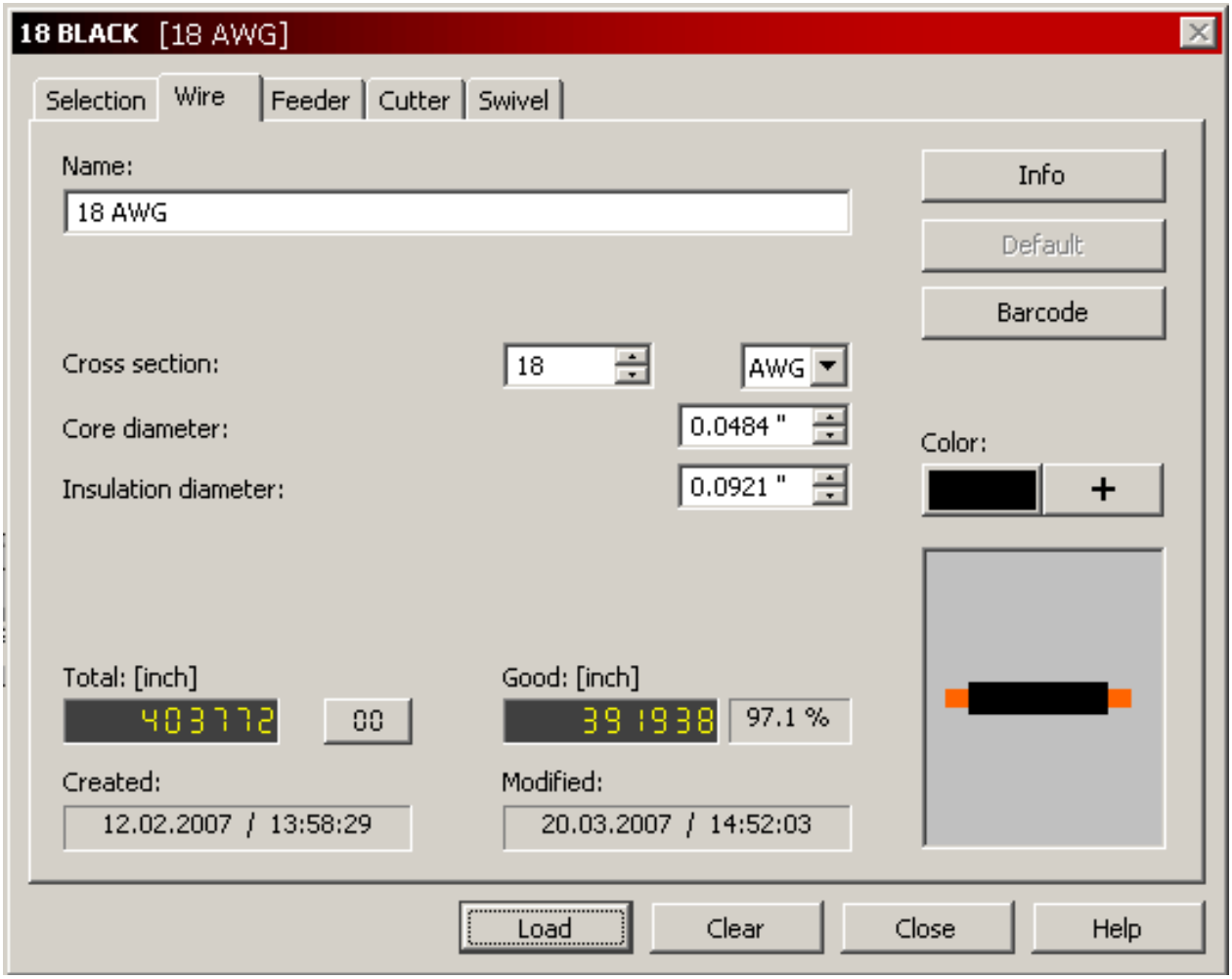


Figure 17

6. Select “Load” to set the selected wire for production.

Terminal Setup

1. Using the “Setup” tab in TopWin, left click the desired terminator diagram on the machine layout image to open the terminal setup window.

2. If the terminal is already created simply select it from the list located on the “Selection” tab and press the “Load” button. See Figure 18.

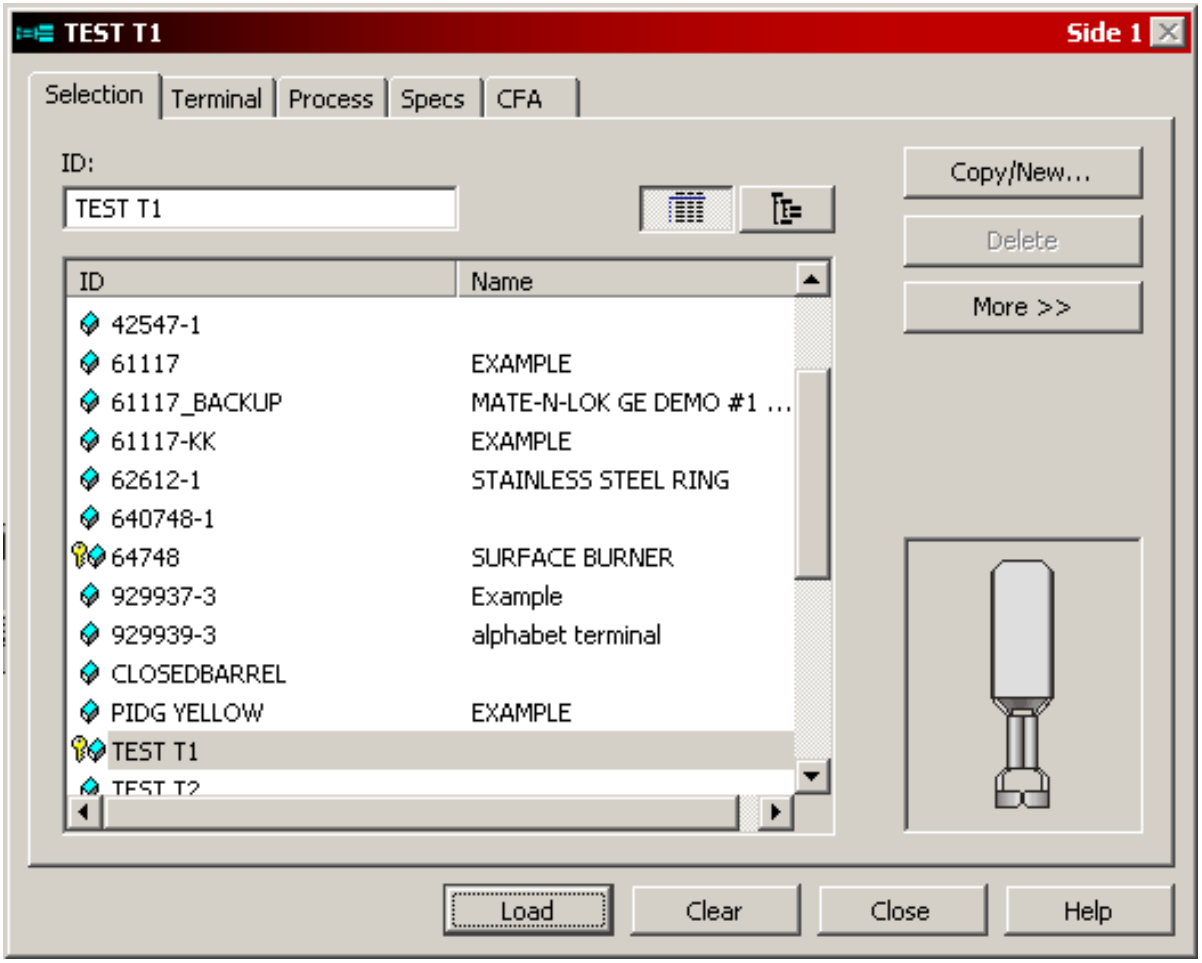


Figure 18

3. To create a new terminal select the “Copy/New” button and give the new terminal an ID (identifying name).

4. Next, give the terminal a description under the “Terminal” tab. See Figure 19.

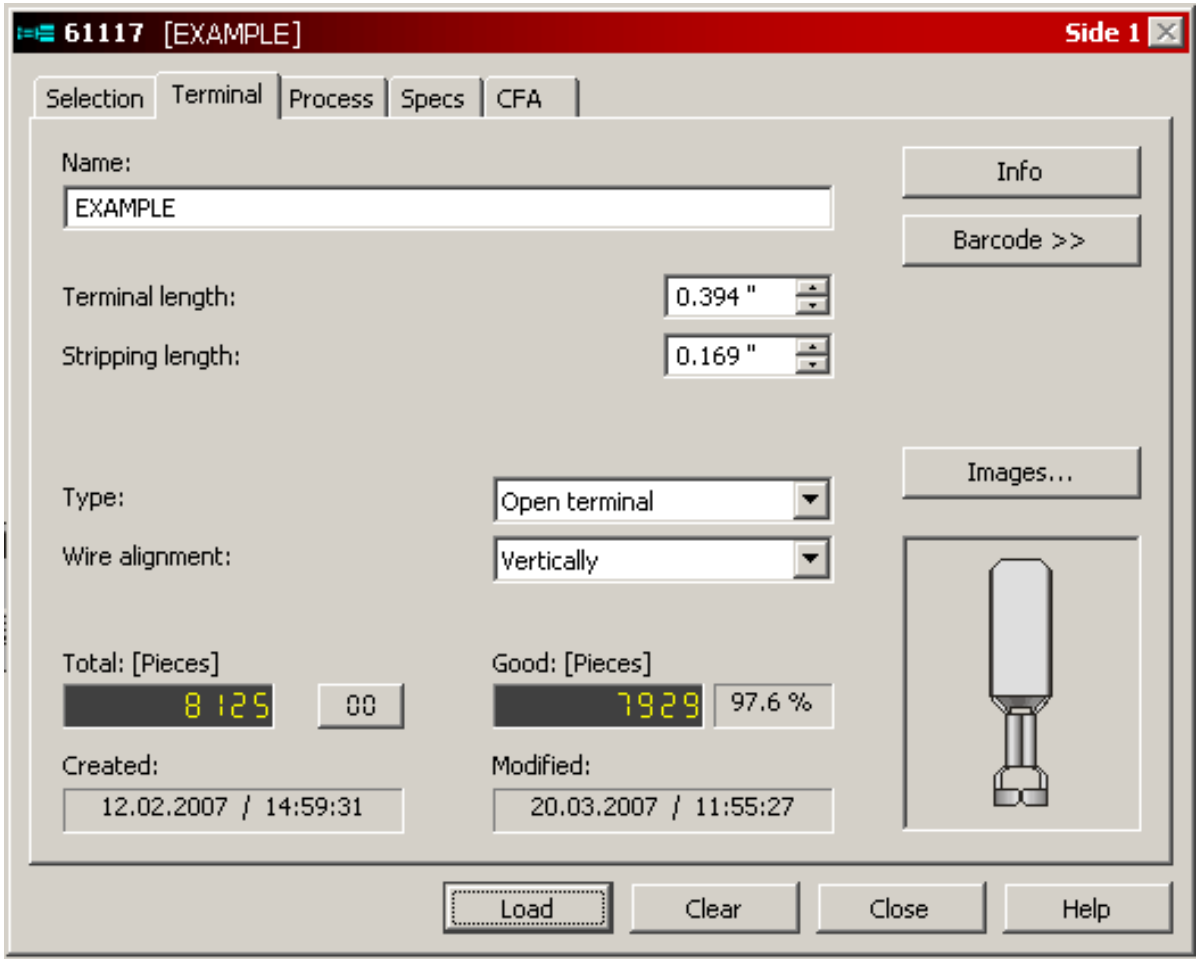


Figure 19

5. Also enter information about the terminal such as “Terminal Length,” “Strip Length,” “Type,” and “Wire Alignment.”

6. Next select an image that closely resembles the style of terminal.

7. Under the “Process” tab, set options like “optimization” and press speed. See Figure 20.

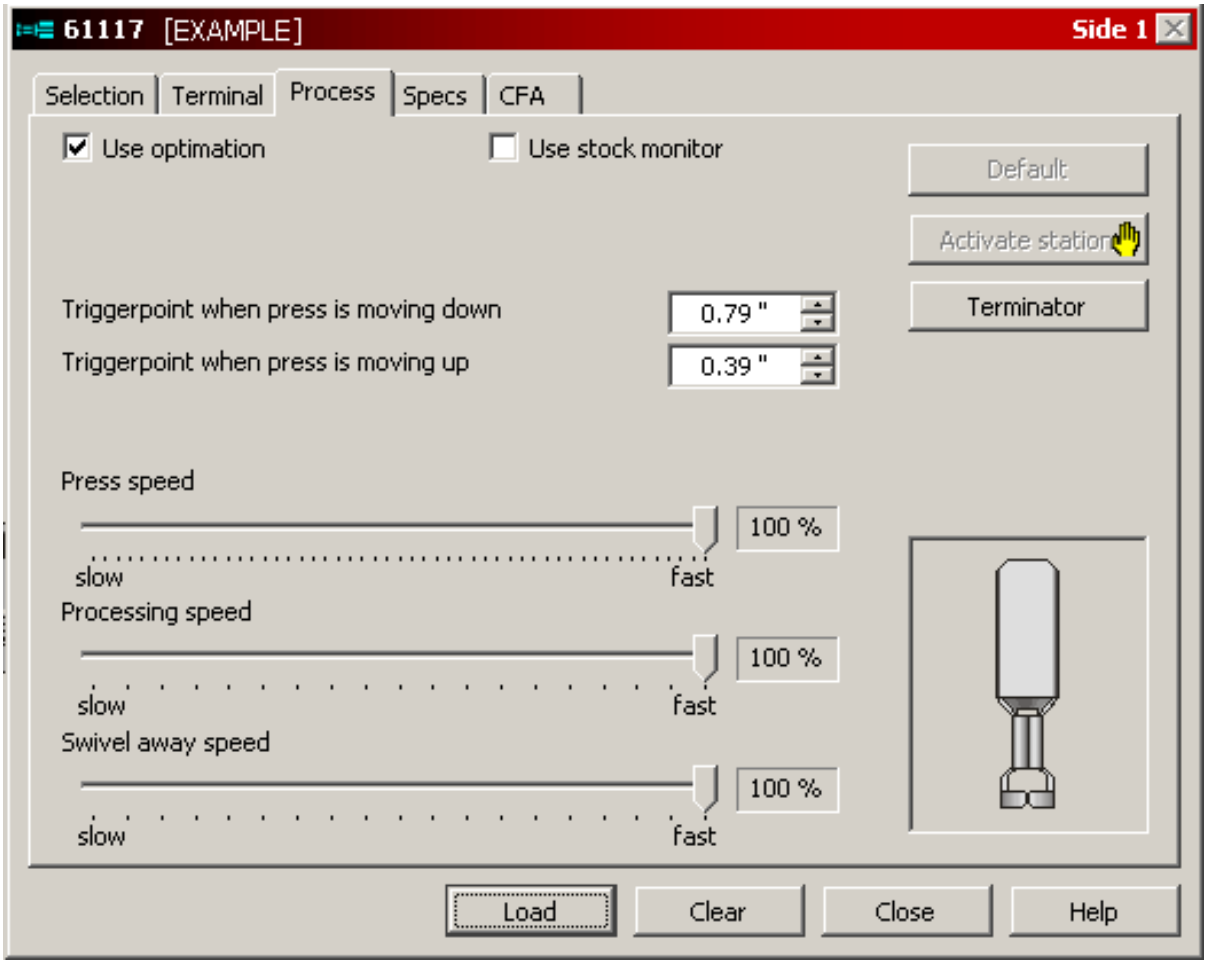


Figure 20

The terminal specific terminator options can also be set from this tab by pressing the “Terminator” button.

8. The crimp specifications can be added under the “Specs” tab. (Figure 21.) Add the specifications for each wire size the terminal is able to accommodate.

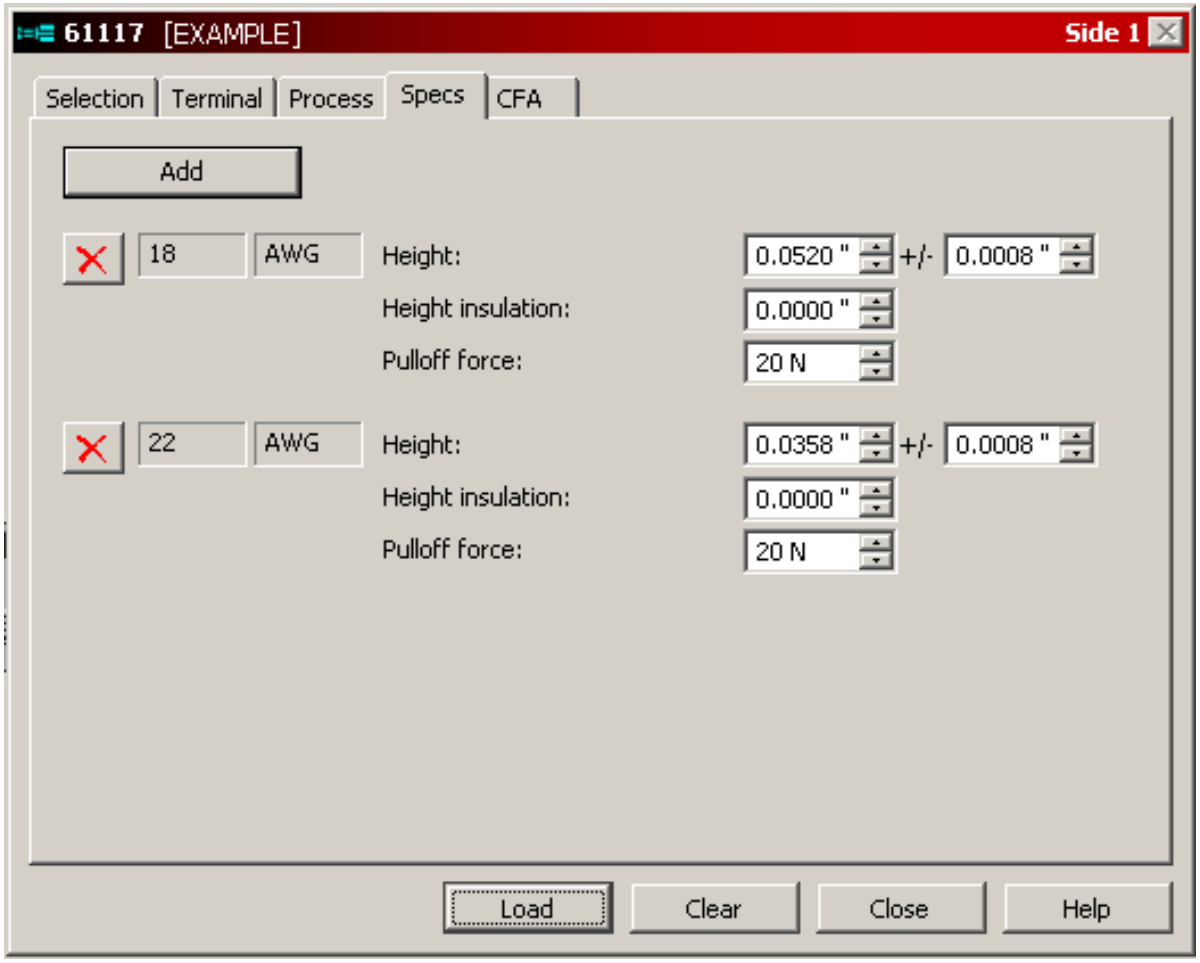


Figure 21

9. Crimp Force Analysis (CFA) can be turned on under the “CFA” tab. (Figure 22.) The CFA settings can be modified using the “SLE CQM” pushbutton. Refer to 409–10076.

10. Press “Load” to install the terminal onto the terminator.

11. Move the mouse pointer over the terminator diagram on the machine layout image until the loaded terminal appears.

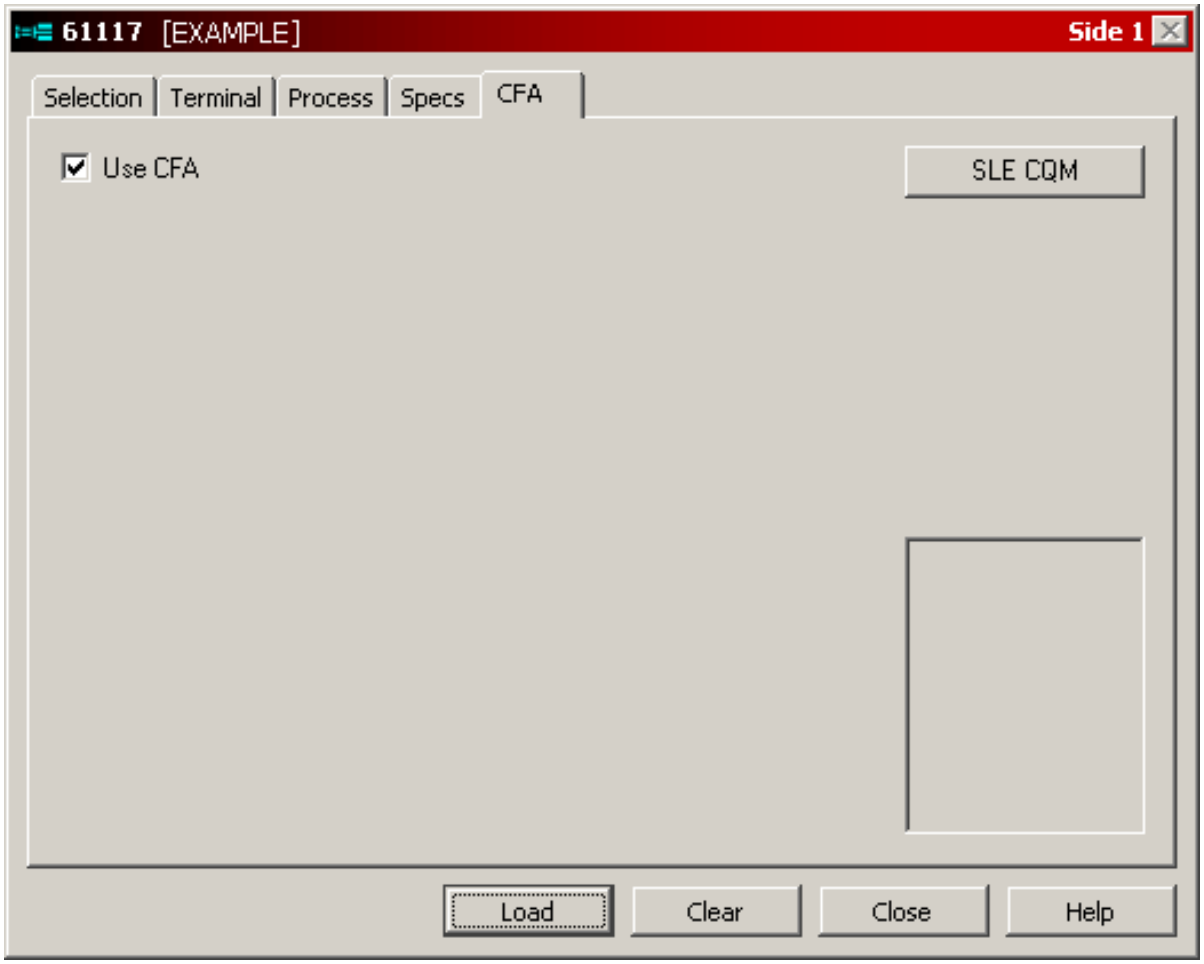


Figure 22

12. Drag and drop the terminal onto the wire end to finish the setup of the terminal.
13. Repeat this setup (Steps 1 through 12) for each terminator.

B. Solder Gaging of Applicators Used on the AMPOMATOR System III Machine (For Closed Barrel Terminals Only)

These instructions are intended as a supplement to the crimp die and terminal specific specifications/instructions.

1. Place the applicator in the terminator with terminals loaded.
2. Gather the appropriate solder size as specified in the crimp die specification.
3. Create a new article for the terminal to be applied.
4. Enter the solder crimp height specification for the specific wire size. See Figure 23.

NOTE

Nominal height may need calculated based on tolerance range provided in terminal/die specific specification.

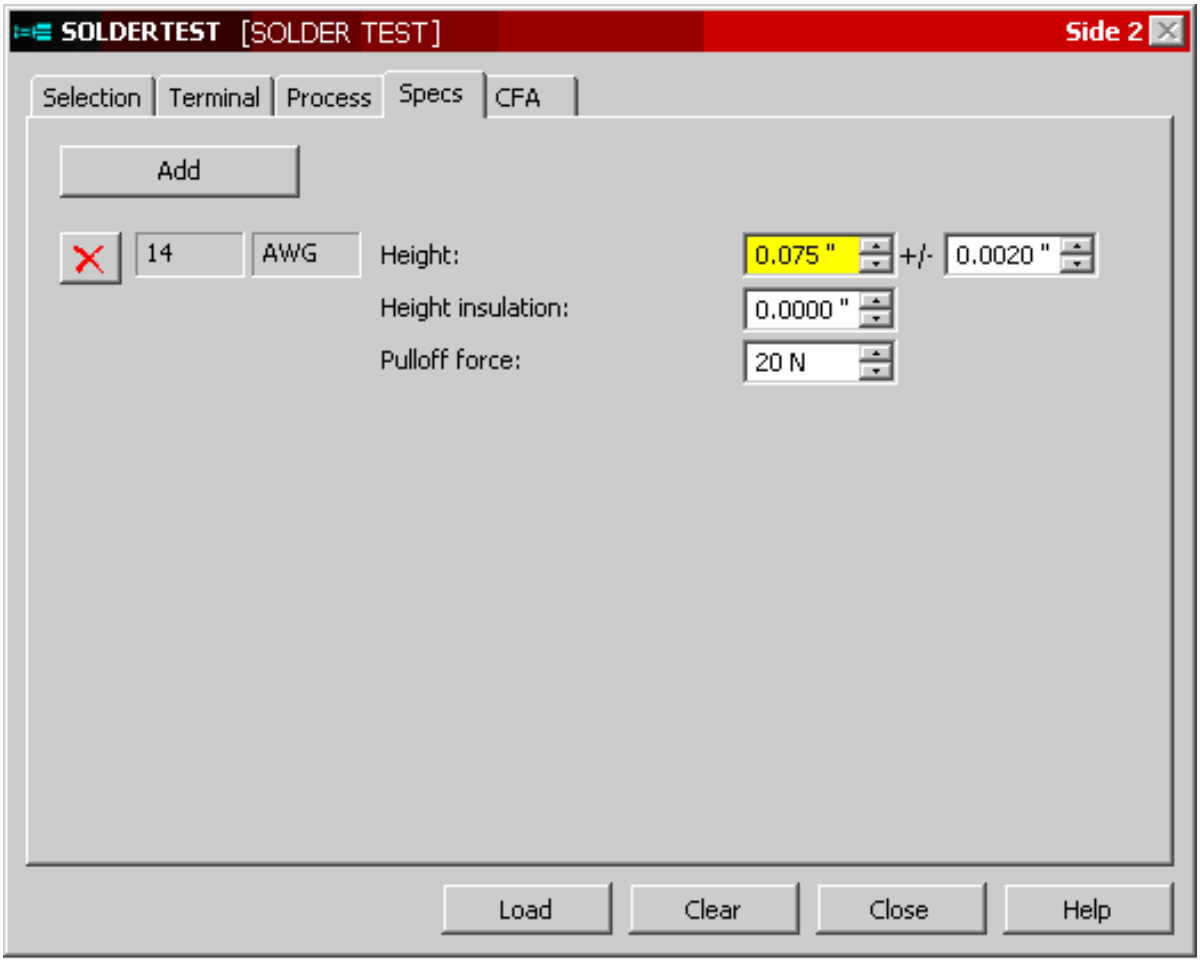


Figure 23

5. Perform other required setup procedures needed to run production. Activate the “Verify Crimp Height” option but do not run samples.
6. Remove terminals from applicator.
7. Lower the guards.
8. Select “Short Sample” and allow the leadmaker to generate a sample without a terminal.

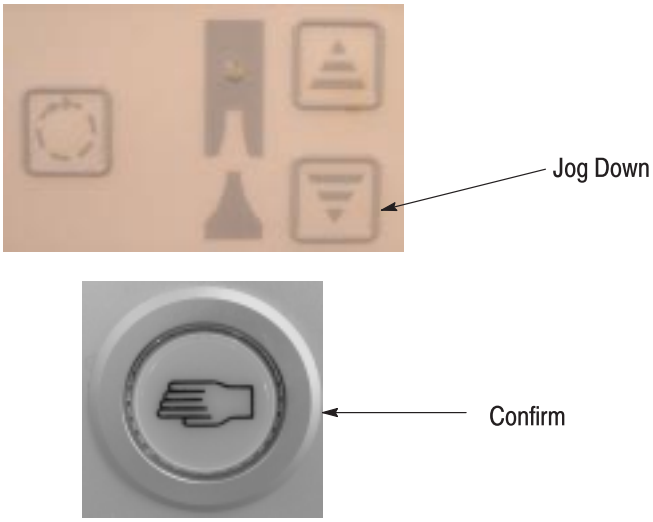


Figure 24

9. When prompted to enter measured crimp height, raise the guards and press the “Jog Down” or “Jog Full” button in addition to the “Confirm” button (Refer to Figure 24) until the solder can be held in place by the crimp tooling. (See Figure 25). Next, use the “Jog Full” button to complete the crimp cycle.

Figure 25

NOTE

If the “Jog Full” button causes the ram to move up, continue to press and hold the “Jog Full” button until the next cycle can begin.

10. Measure solder crimp height and enter value into “Verifying” window as shown in Figure 26.

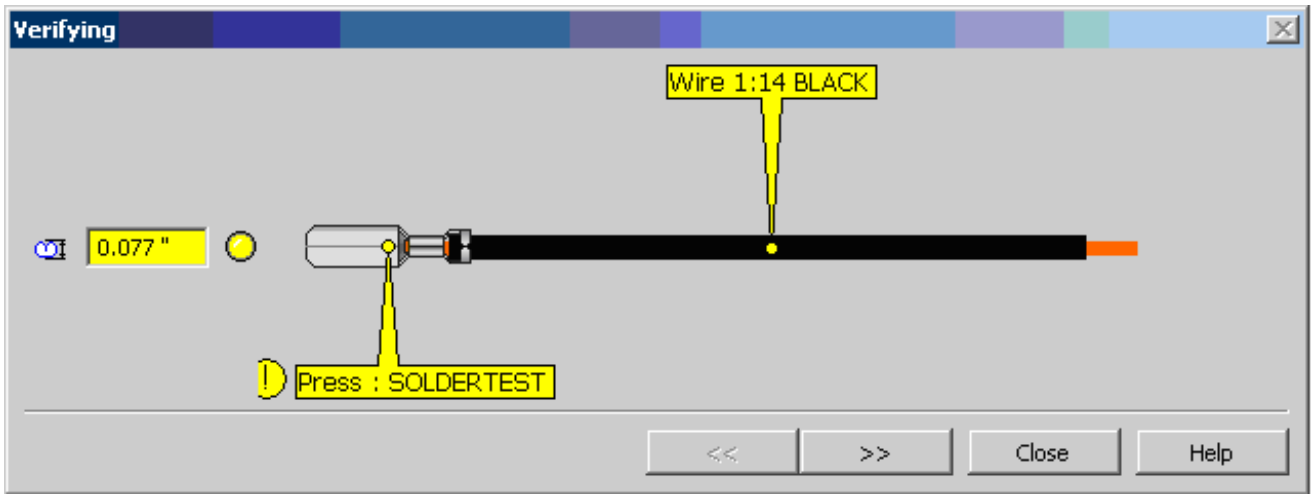


Figure 26

11. If the solder crimp height is incorrect, lower the guards and repeat Step 8 through Step 10 until the measured crimp height matches the specification. If the correct solder crimp height can not be obtained, evaluate the system for a problem.

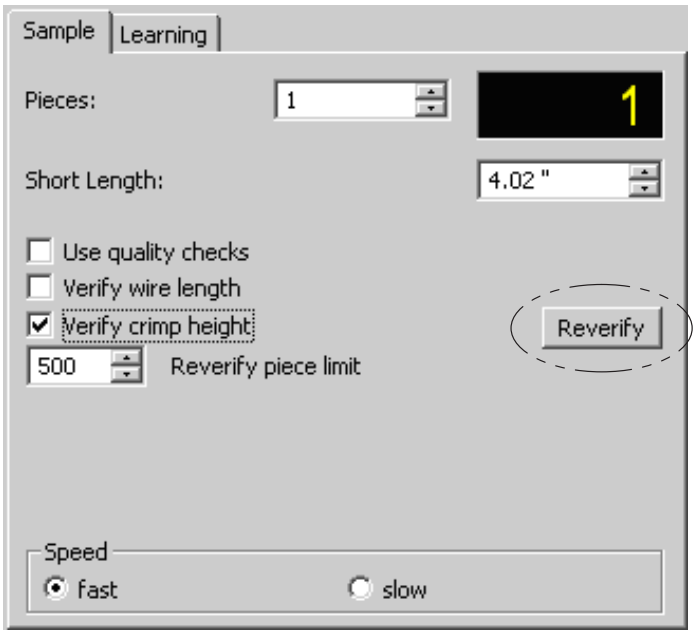
12. Load terminals and run a short sample.

13. Verify that the crimp meets all the requirements in the terminal application specification.

CAUTION

Higher crimp force terminals that utilize bottoming dies may require additional adjustment to the terminator crimp height to account for machine flex. Regardless of adjustment, all crimps must meet the requirements contained in the terminal application specification.

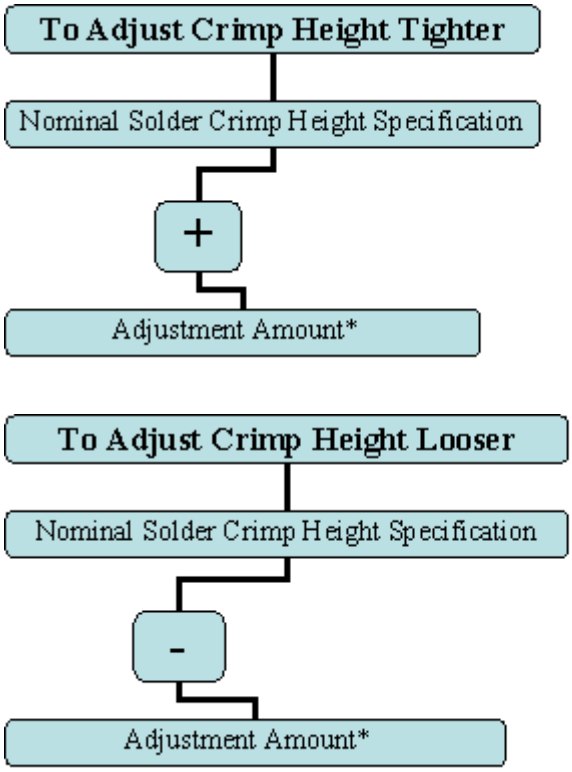
14. If additional adjustments to the terminator crimp height are required, perform the following steps.
    a. Press the “Re–verify” button.



b. Remove terminals from the applicator.

c. Select “Short Sample” and allow the leadmaker to generate a sample with out a terminal.

d. When prompted to enter measured crimp height, perform the following calculation to determine the value to enter.



* The adjustment amount is estimated based on crimp performance as determined by the terminal specification.

NOTE

Optimal crimp performance is achieved by fully bottoming the crimping dies during termination (where applicable). The exact amount of adjustment required to bottom the dies is dependent on the crimp force of the terminal, terminator flex, and wire size.

CAUTION

Care must be taken NOT to over adjust the crimp height. Over adjustment of the crimp height can result in damaged tooling, press stalling, and/or bad crimps.

e. Repeat Steps c. and Step d. until the crimp is acceptable.

15. Load terminals and run production.

C. Pre–production Setup and Adjustment

1. Perform the swivel adjustment.
   a. Adjust the swivel/wire position (used when crimping,) using the “Setup Single Step” button located on the “Setup” tab in TopWin.
   b. Select the desired side to setup.
   c. Select “Setup” to proceed directly to setting up the terminator.
   d. Select “Single Step” to step through each step prior to setting up the swivel to terminator position.
   e. Select the “Press” button to begin.
   f. Select “Move to Process Position” to move swivel to the last saved process position.

NOTE

Select “Move to Safety Position” to move the swivel to a safer default position.

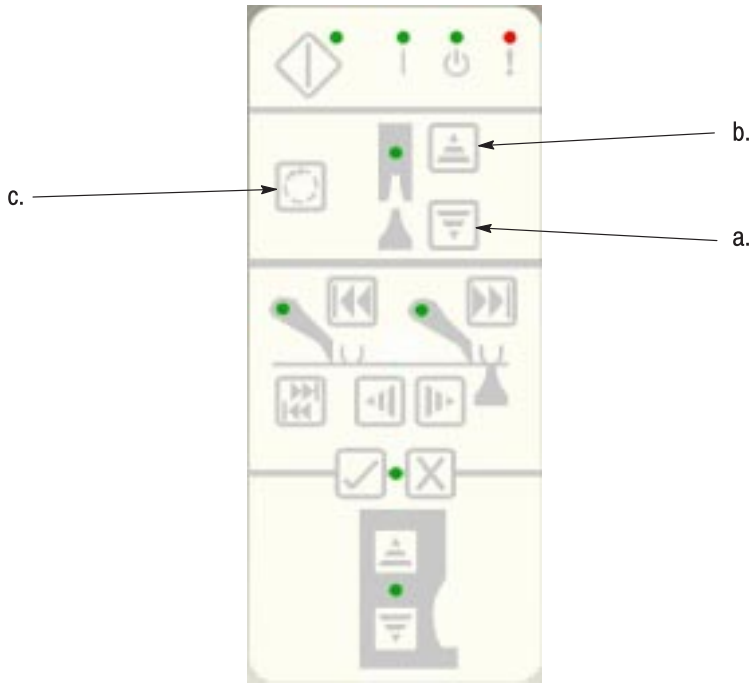
CAUTION

It is recommended that the “Move to Safety Position” be used, in order to prevent a tooling crash.

   g. To adjust the location of the swivel/wire, select the “Positioning” button.
   h. Use the arrow buttons to adjust the location of the swivel.
   i. Once complete, select the save icon under the “process” section of the window.
   j. Set the tonk and terminator vertical height ***prior*** to exiting the single step mode. (See Steps 2, 3, 4, and 5 that follow.)
   k. The following options are now available: “Execute Process,” “Continue without Processing,” or “Back.”

2. Set the jog features.

Jog the terminator using the keypad located on the side of the terminator.



   a. To jog down to bottom–dead–center, press and hold the “confirm” button, then press and hold the down arrow key on the keypad.
   b. To jog up to top–dead–center, press and hold the “confirm” button, then press and hold the up arrow key on the keypad.

c. The terminator can also be jogged through a full cycle at a reduced speed. To jog through a full cycle, press and hold the “confirm” button, then press and hold the Jog Full Cycle Pushbutton on the keypad.

NOTE

The servo terminator may not be able to jog through high force terminals at this point.

3. Set the terminator height adjustment.

The adjustment of the terminator height can be performed at any time during setup or production.

a. Press and hold the “confirm” button, then press and hold the up or down arrow key on the keypad.

b. A flashing LED on the keypad indicates a change was made. This change can be saved or canceled by pressing the “✓” or“ X” key.

c. A flashing red LED (top right of the keypad) during adjustment indicates the adjustment is outside the programmed adjustment range and can not be saved.

4. Set the tonk adjustment.

The tonk adjustment is normally best performed in single step mode while the swivel arm is in place.

a. Loosen the locking jam nut on the tonk screw.

b. Adjust the tonk screw so the wire remains straight while jogging through the crimp.

c. Retighten the jam nut on the tonk screw

5. Verify the Crimp Height (CH)

The terminal crimp height can be adjusted at the “Sample” tab of TopWin.

NOTE

To activate this feature be sure the “Verify Crimp Height” is checked in the “Sample” tab of TopWin

a. Select the “Short Sample” button to crimp the required samples. The quantity of required samples is adjustable with a minimum requirement of one sample.

b. Using crimp height micrometers, measure the crimp height of the sample(s). Enter the measured value(s) into the appropriate location in the pop–up window.

c. Press the “Enter” button to determine if the crimp meets specifications. If the indicator turns green the crimp meets specifications. If the indicator turns red the crimp is out of specification.

d. Continue running “Short Sample” until the crimp is within specification.

e. Re–verification of the crimp height can be performed at any time by pressing the “Re–verify” button and rerunning to “Short Sample” mode.

6. “Learn” the CQM.

Once the crimp height has been verified, the crimp force profile can be saved, or learned.

a. Assure that the CFA is turned on for the required terminal.

b. Set the required crimp count for the learn process.

c. Select the“Learn” button and begin crimping.

d. Monitor the display status window to be sure the “learn” process was completed correctly.

2.4. Production Run Process

1. Set total Crimp Count and Batch Size.

a. In the “Production” tab of TopWin, enter the total production count.

b. In addition to the total production quantity, also enter the batch size. The article deposit will extend after each batch quantity is reached. The operator must press the “Start” button to continue production.

2. Clear the Crimp Quality Information

NOTE

CQM SPC information is cleared automatically each time the "Learn" process is completed.

a. Clear the crimp quality information for ***each*** terminal.

b. Double click on the CQM result window to clear data.

c. Select "Clear SPC" to reset the results in the results window.

3. Begin production.

a. Production can begin once all of the setup is complete.

b. Total good crimps and total bad crimps are displayed along with machine rate and crimp results if CQM is active.

3. LEADMAKER PRE–PRODUCTION SETUP

3.1. Leadmaker Setup and Calibration

The leadmaker comes from the factory properly setup and calibrated. However the following setup and calibration settings should be performed if a problem is suspected or if maintenance is performed on the machine. Specific information about each step can be found in the noted sections of the Komax Leadmaker manual.

A. Adjusting the Mechanical Zero of the Motor Axes

If you notice, while resetting the machine (or at some other time) that the swivel units are out of alignment with the blade head, it will be necessary to reset the zero position of the motor involved.

- The motor axes of the pull–off units on Side 1 and Side 2 are automatically calibrated.
- The zero position of the swivel units is set from the software and with the help of a sensor.

Zero the swivel units if the drive motor, a toothed belt, a sensor or the PPC cards have been replaced.

A special adjusting tool kit (Figure 27) is required to adjust the mechanical zero of the swivel and pull–off units on Side 1 and Side 2. This tool kit consists of a setup gage, a spacer shaft, a guide tube (4 mm o.d. / 39.5 mm long) for Side 1, and an arbor tool for Side 2.

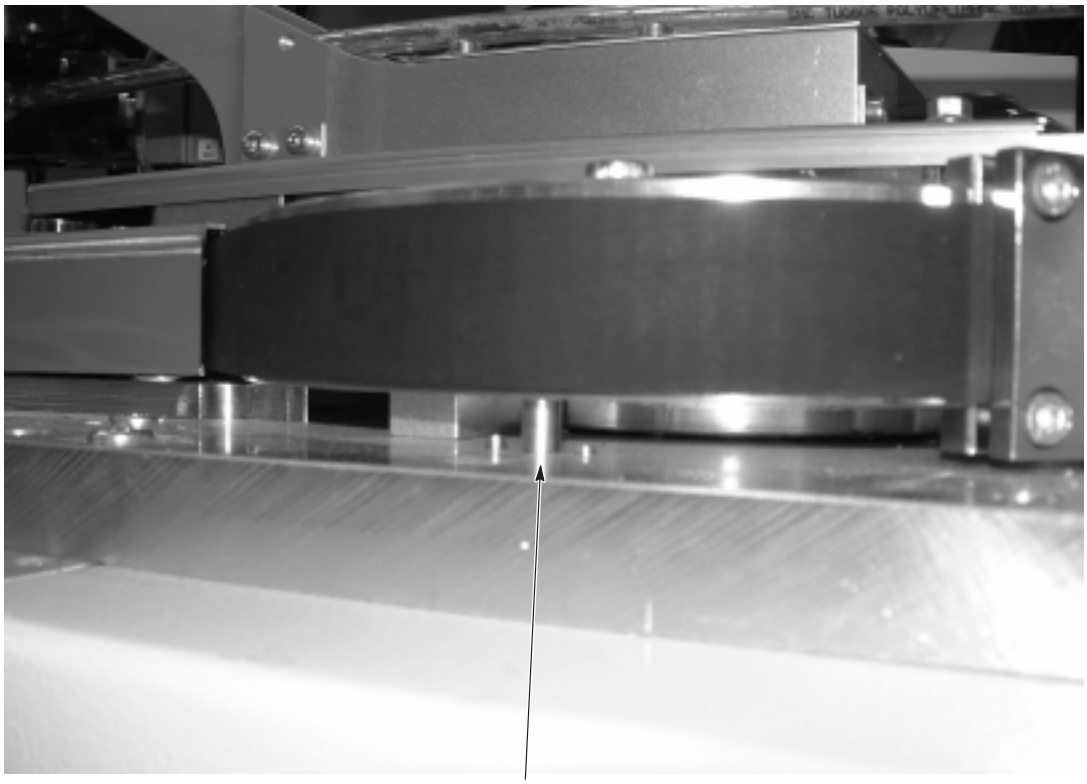
CAUTION

To prevent collisions,ALWAYS remove the adjusting tool kit prior to resuming production.

Aligning the Swivel and Pull–Off Unit, Side 1

To adjust the mechanical zero of the swivel and pull–off on Side 1, proceed as follows:

1. Swivel the arm to cut blade alignment Side 1. See Figure 50.
2. Remove the top and bottom blade blocks.
3. Mount the setup gage to the bottom blade alignment block. See Figure 27.
4. Loosen the six fastening screws from the base plate for the swivel and pull–off unit on Side 1 and move the unit back toward the belt drive. Re–tighten *one* of the six screws.
5. Replace the wire guide tube on the swivel and pull –off unit on Side 1 with the guide tube.
6. Reset the machine.



Sensor on the Swivel Unit –– Side 1

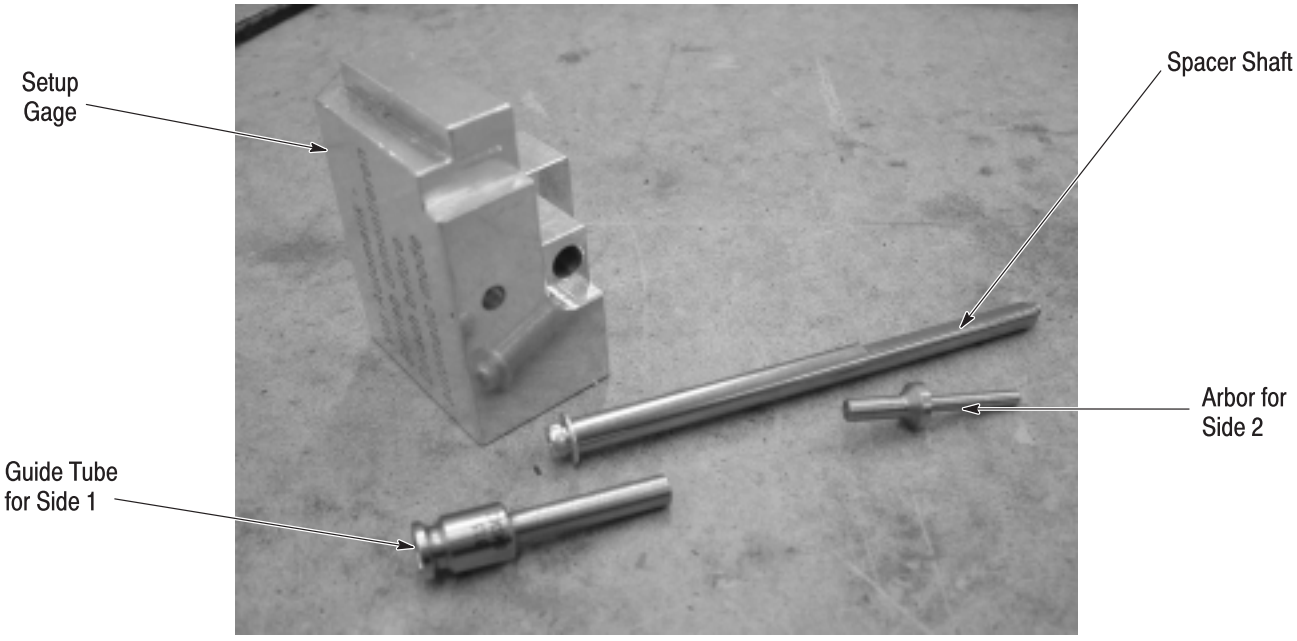


Figure 27

7. Shift the unit toward the cutting head until the guide tube touches the setup gage at a point indicated by the arrow in Figure 28.

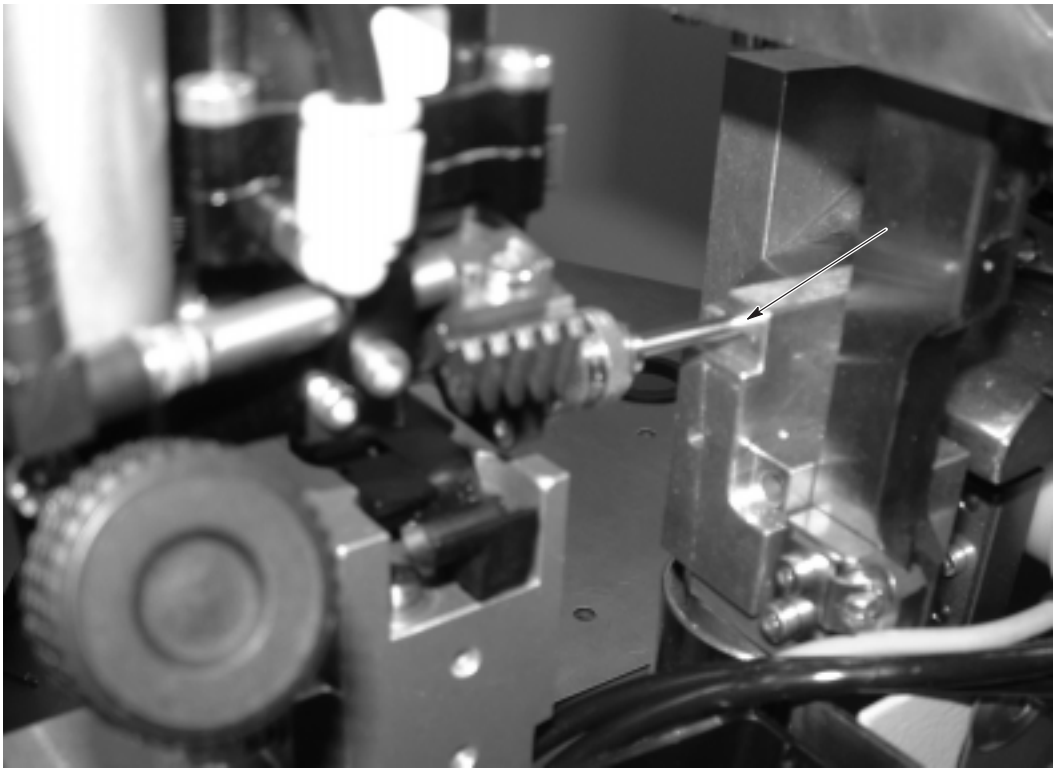


Figure 28

8. Shift the unit toward the cutting head until the guide tube touches the setup gage at a point indicated by the arrow in Figure 28.

9. Re–tighten the six fastening screws of the base plate. Check to make sure the plate is aligned with the machine frame.

The swivel and pull–off unit on Side 1 is now aligned in terms of depth.

To align the unit laterally, the guide tube must fit into the hole of the setup gage. Proceed as follows:

10. Switch the power “off,” and then back “on” again (without a reset).

11. Switch to the configuration menu and select the swivel–pull–off symbol/swivel unit you desire.

12. Insert the guide tube into the hole in the setup gage (Figure 29). If the height of the gripper also requires adjustment, adjust it by turning the adjustment screw shown in Figure 30. Remember that if you switch the gripper height, the sensor in Figure 30 also must be adjusted.

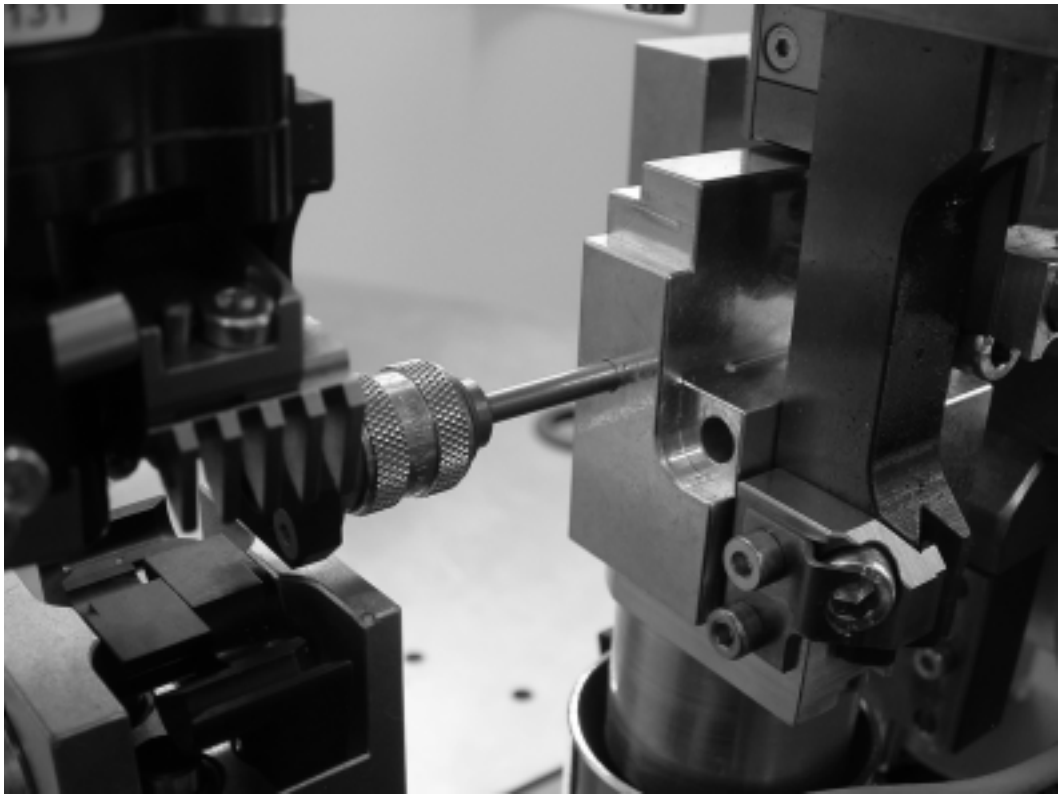


Figure 29

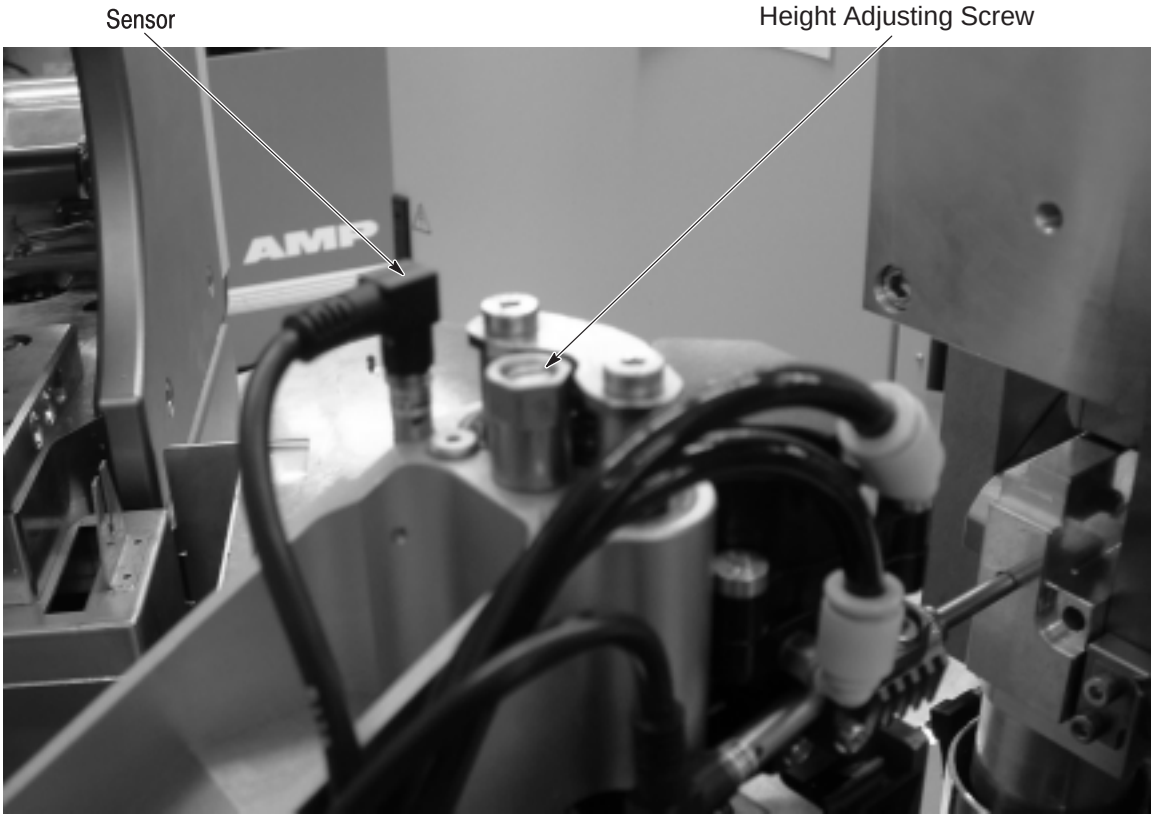


Figure 30

13. Save the position by selecting the save button (on the screen).

Aligning the Swivel and Pull–Off Unit, Side 2

Adjusting the zero position of the swivel and pull–off unit on Side 2 is accomplished in the same manner as the Side1 unit, with the following exceptions:

1. Swivel the arm to cut blade alignment Side 2.
2. In the machine configuration screen, select “Swivel Adjustment, Side 2.”
3. Note that the depth position is already preset.
4. Once the machine is finished setting up for the swivel adjustment, use a hex wrench to open the Side 2 grip jaws and insert the (arbor) setup gage.
5. Insert the arbor for Side 2 in the grippers, ensuring that the face of the arbor rests on the face of the grippers as you do. See the arrow in Figure 31.

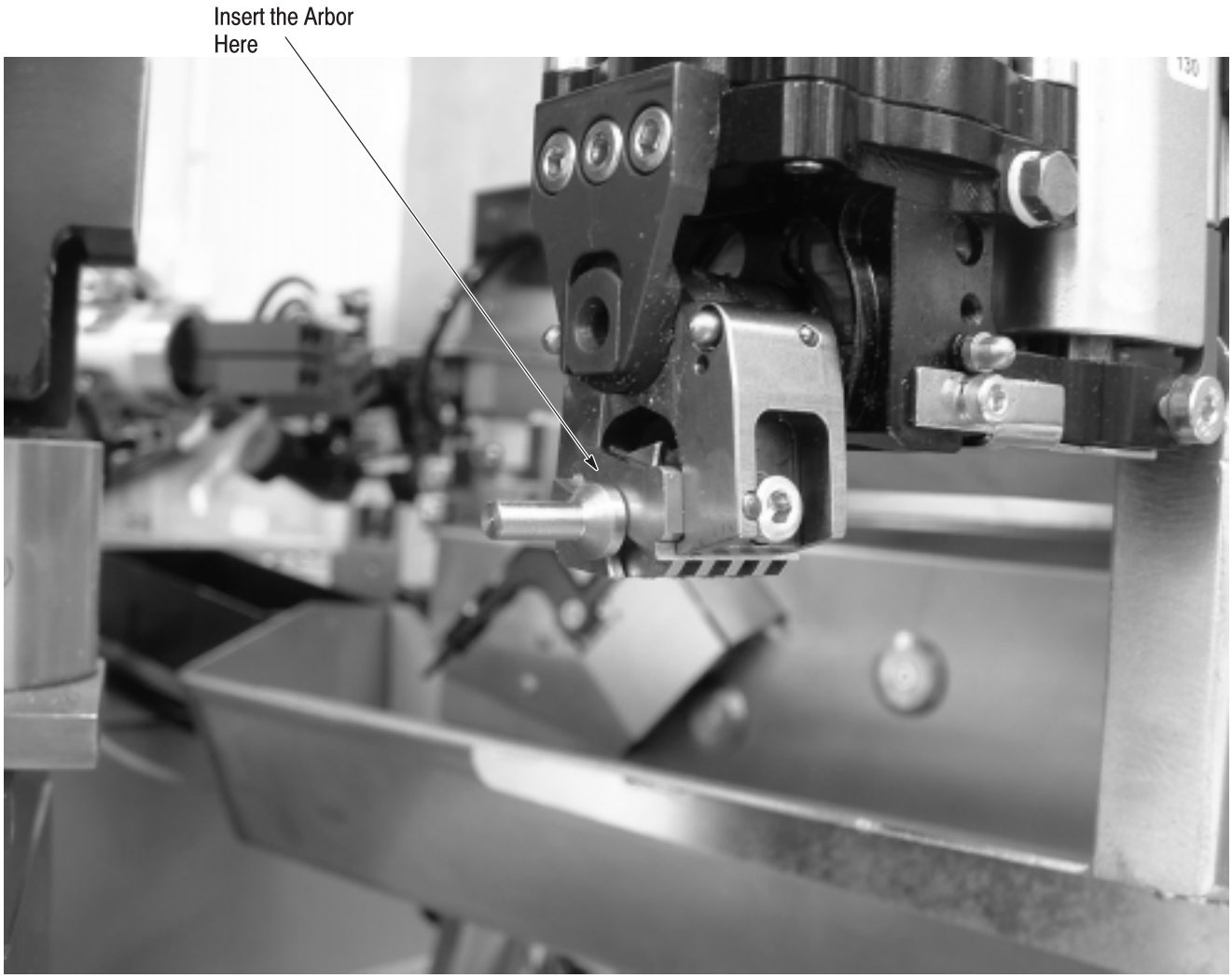


Figure 31

6. For lateral alignment, the arbor must fit in the hole of the set up gage, just as on Side 1. See Figure 32. Refer to Side 1, Step 8 through Step 11.

NOTE

The gripper jaws must remain closed throughout the alignment procedure and also after the position is saved (Confirmed).

Figure 32

B. Adjusting the Hold–Up Device

The hold–up device (Figure 33) should be 2 mm from the wire ramp. The height of mechanical stop should be 23.5 mm.

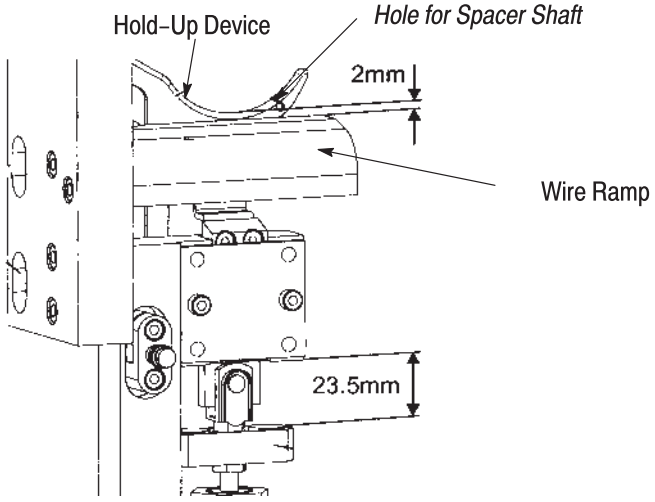


Figure 33

The position of the hold–up device is adjusted using the setup gage. To make this adjustment, make sure the cutting head is completely closed.

Slide the spacer shaft through the hole in the setup gage. The spacer shaft must fit in the hole in the setup gage. If it fails to fit, shift the hold–up shaft along the slots. See Figure 34.

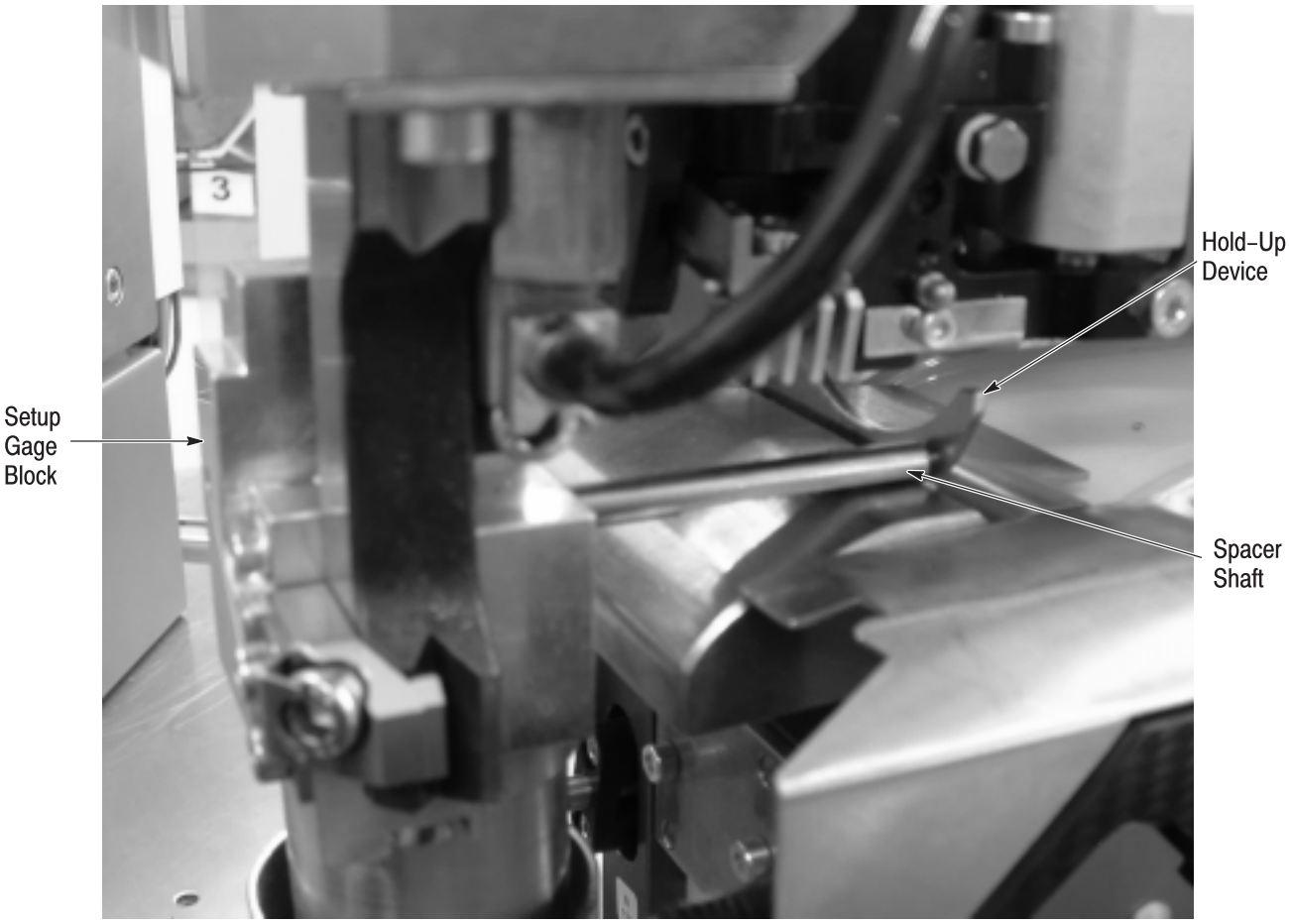


Figure 34

NOTE

When the gripper jaws on the swivel and pull–off unit on Side 2 are half open, there should be a gap of approximately 0.5 mm between the grippers and the wire ramp. See Figure 33.

C. Adjusting the Wire Guide Grippers

After adjusting the swivel and pull–off unit on Side 1, always check to see if the wire guide gripper requires adjustment.

NOTE

The wire guide gripper on the swivel and pull–off unit must be aligned with the holder for the wire.

NOTE

If the swivel and pull–off unit are aligned correctly, there will be a gap of 0.8 mm between the two components. Refer to Figure 35.

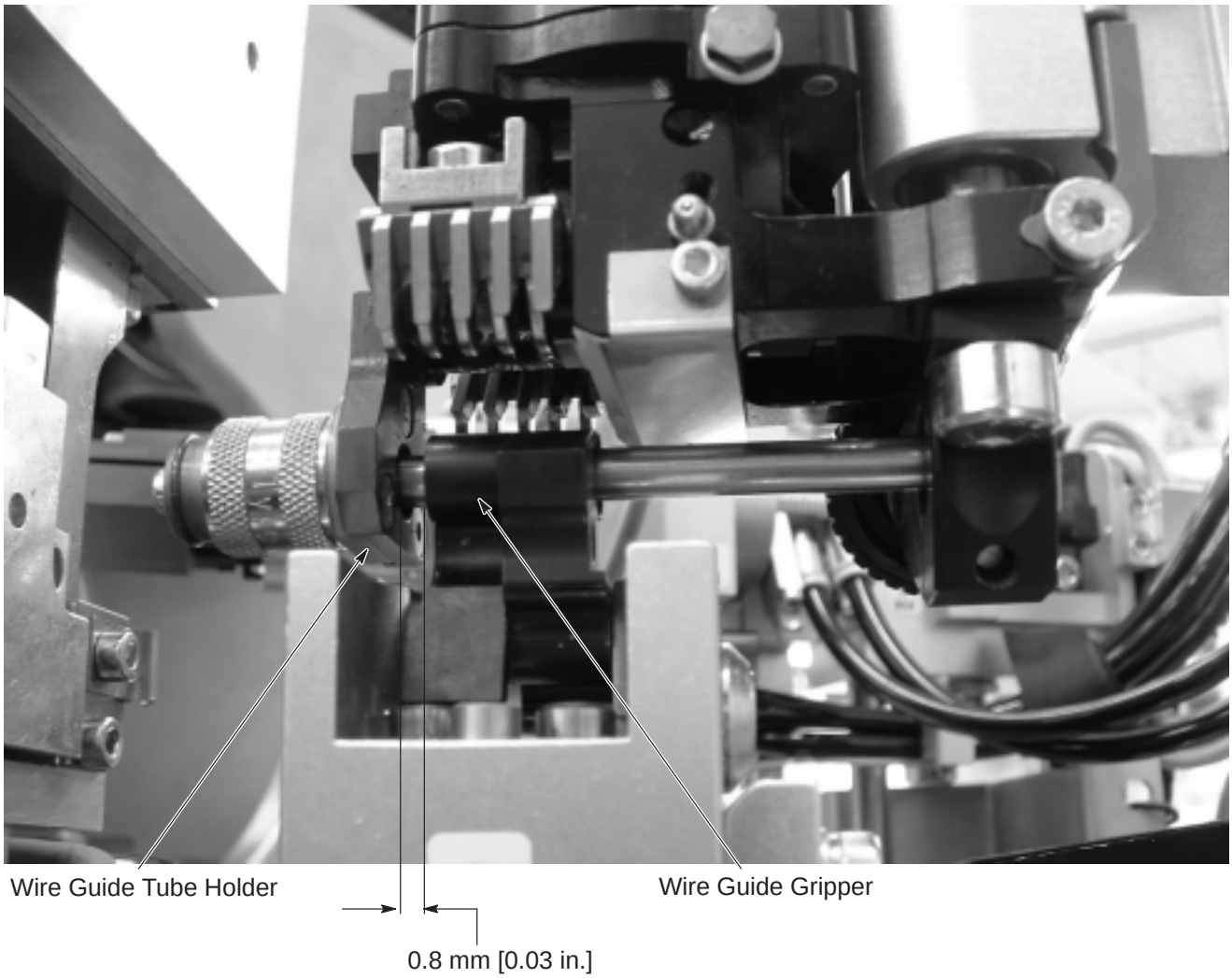


Figure 35

To set the wire guide grippers, proceed as follows:

1. Reset the machine.
2. Remove the guide tubes and hose.
3. Loosen the screws shown in Figure 36.

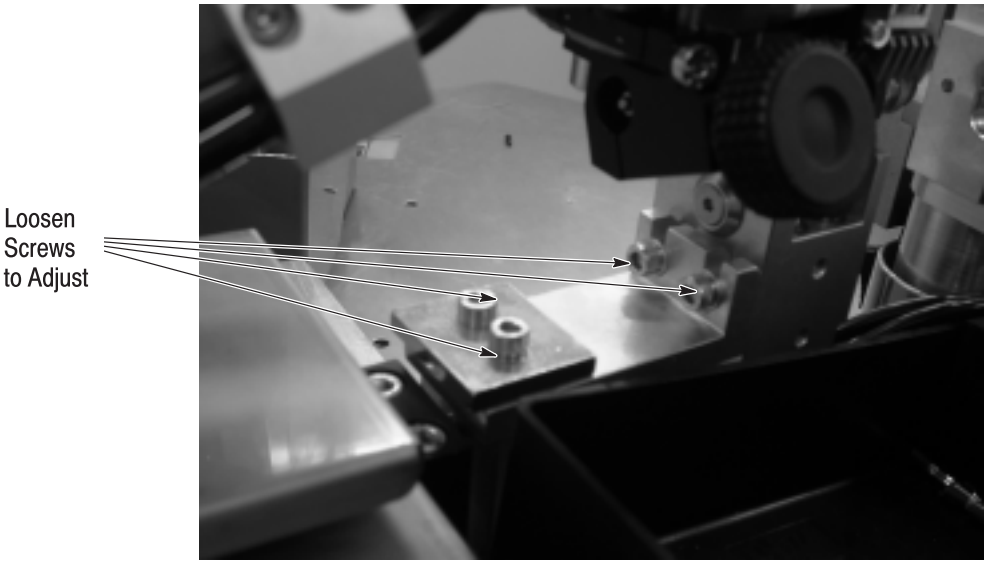


Figure 36

4. Insert the spacer shaft (Figure 33 and Figure 34) into the holder for the wire guide tubes and close the grippers of the wire guide grippers.

NOTE

Close the gripper from the screen. Go to the menu and select "BIO–Debug." BIO output No. 2 closes the wire guide gripper. See Figure 37.

5. Set the distance between the wire guide gripper and the holder a 0.8 mm. See Figure 35.

6. Tighten the screws loosened in Figure 36.

7. Check the wire guide grippers for the correct position by repeatedly opening and closing them. The swivel and pull–off unit must remain motionless when you do this.

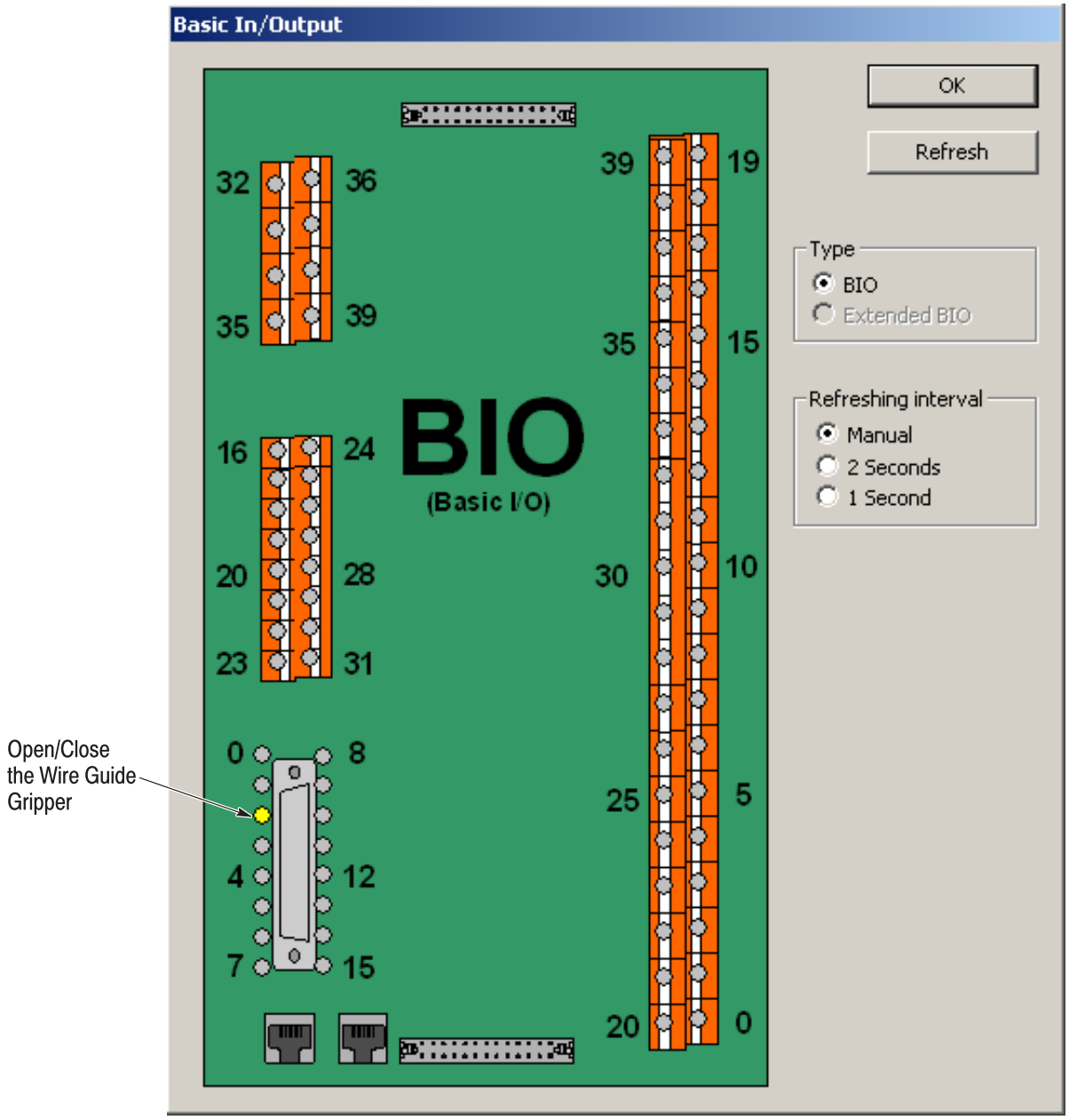
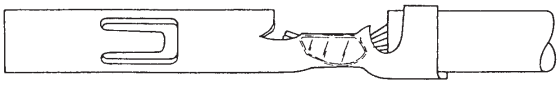


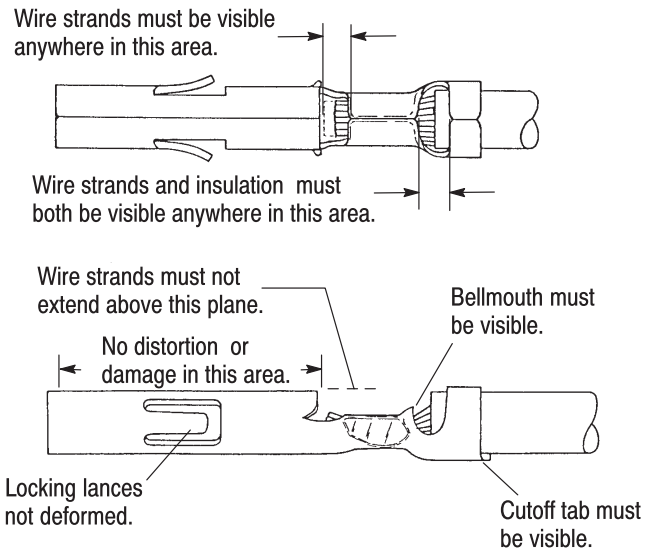
Figure 37

3.2. Termination Quality

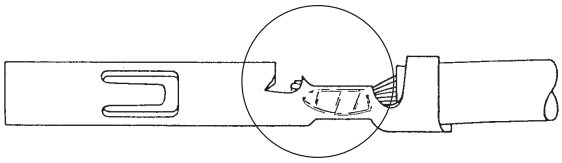
Many of the problems which arise during machine usage are the result of improper adjustments rather than machine malfunctions. These problems will generally manifest themselves as one of the poor quality terminations shown in Figure 38, Figure 39, or Figure 40. Those shown in Figure 38 and Figure 39 are a result of a poorly adjusted applicator; those shown in Figure 40 are the result of improper machine adjustments.

Terminated Correctly

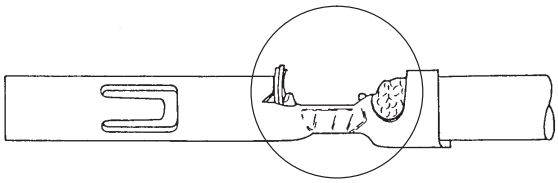




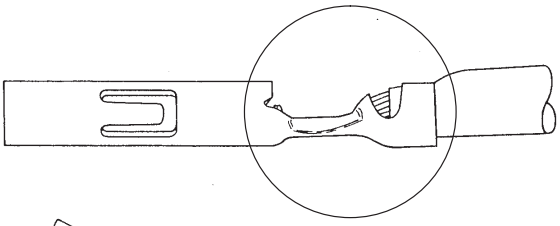
Terminations Unacceptable with Causes



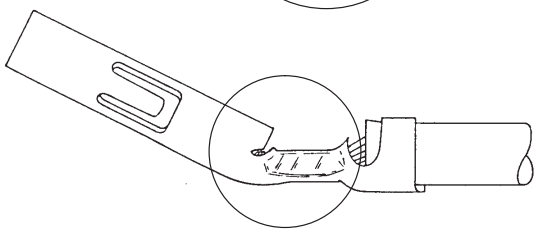
Bellmouth on wrong end of wire barrel — long cutoff tab.
CAUSE: Strip guide plate screw out of adjustment.



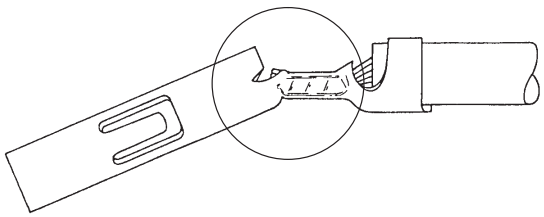
Wire located too far through wire barrel.
CAUSE: Too long strip length. Incorrect wire protrusion at applicator.



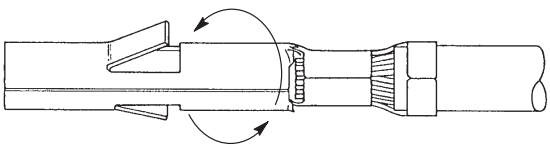
Large bellmouth — no cutoff tab.
CAUSE: Incorrectly adjusted strip guide plate screw. Incorrect wire and insulation disk settings. Wrong terminal in applicator.



Terminal bent upward.
CAUSE: Incorrectly adjusted terminal holddown.



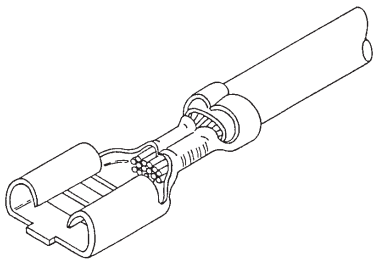
Terminal bent downward.
CAUSE: Damaged or worn tooling. Lack of terminal lubrication (metals such as gold, nickel, silver, and steel require lubrication for termination).

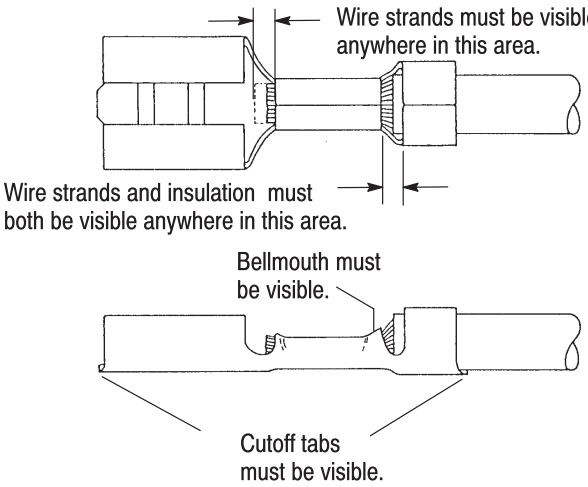


Terminal twisted.
CAUSE: Feed problem. Terminal either overfed or underfed.

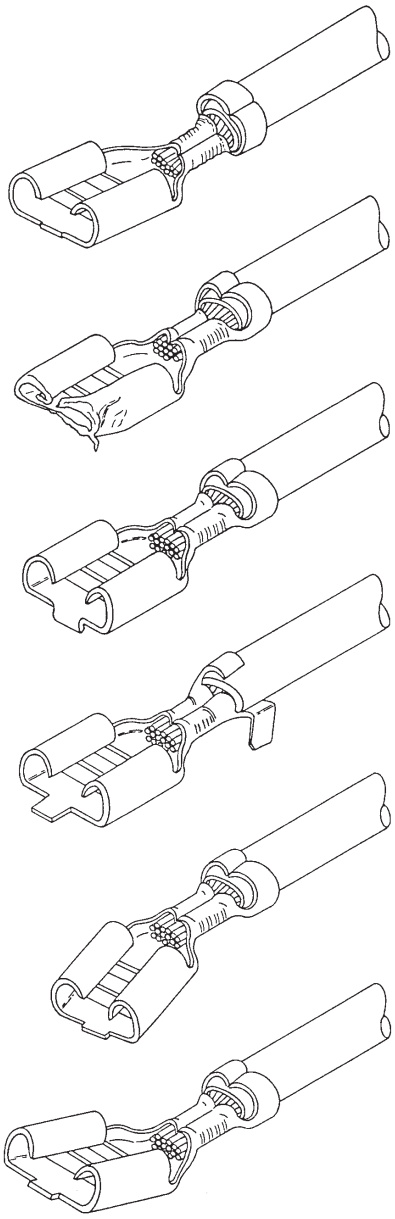
Figure 38

Terminated Correctly





Terminations Unacceptable with Causes



Terminal twisted.
CAUSE: Strip guides not properly aligned.

Front of terminal cut off; bellmouth on wrong end of wire barrel.
CAUSE: Feed problem. Terminal not fed far enough.

Front cutoff tab not sheared properly.
CAUSE: Damaged front shear plate, loose tooling, incorrect tooling, damaged shear blade, or damaged slug blade.

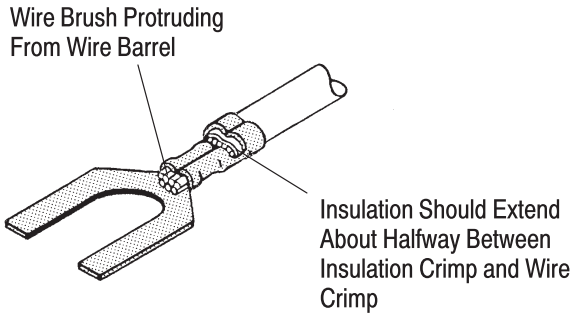
Rear of terminal deformed, long front cutoff tab, large bellmouth.
CAUSE: Feed problem. Terminal fed too far.

Terminal bent downward.
CAUSE: Damaged or worn tooling. Lack of terminal lubrication (metals such as gold, nickel, silver, and steel require lubrication for termination).

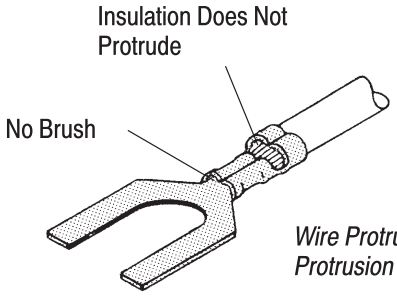
Terminal bent upward.
CAUSE: Terminal holddown missing. Broken holddown spring.

Figure 39

Typical Good Termination

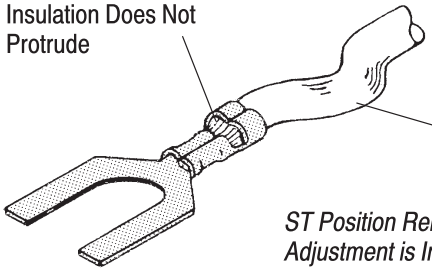


Poor Termination



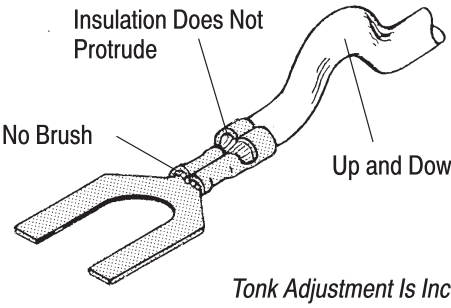
Wire Protrusion Adjustment Incorrect (Adjust Wire Protrusion .)

Poor Termination



ST Position Relative to Wire Transfer Adjustment is Incorrect

Poor Termination



Tonk Adjustment Is Incorrect

Machine Adjustment Problems

Figure 40

4. SERVO TERMINATOR (ST) III PRE–PRODUCTION SETUP

4.1. Terminator Setup and Calibration

A. AMP–O–LECTRIC ST Configuration Screen (Figure 41)

Once the ST Terminator is installed on the base machine and configured in TopWin; terminator options, calibration processes, and diagnostics can be accessed by selecting the  icon from the TopWin toolbar. On this screen, you can choose which terminator you are working with by selecting the correct unit on the image of the Leadmaker. The station that is selected is identified with a green dot on it. The terminators are identified as ST1, ST2 following the convention of Side 1, Side 2 of the base machine. If the machine is the larger 'L' platform, then there may be a third terminator, identified as ST1.2 (Side 1, module 2).

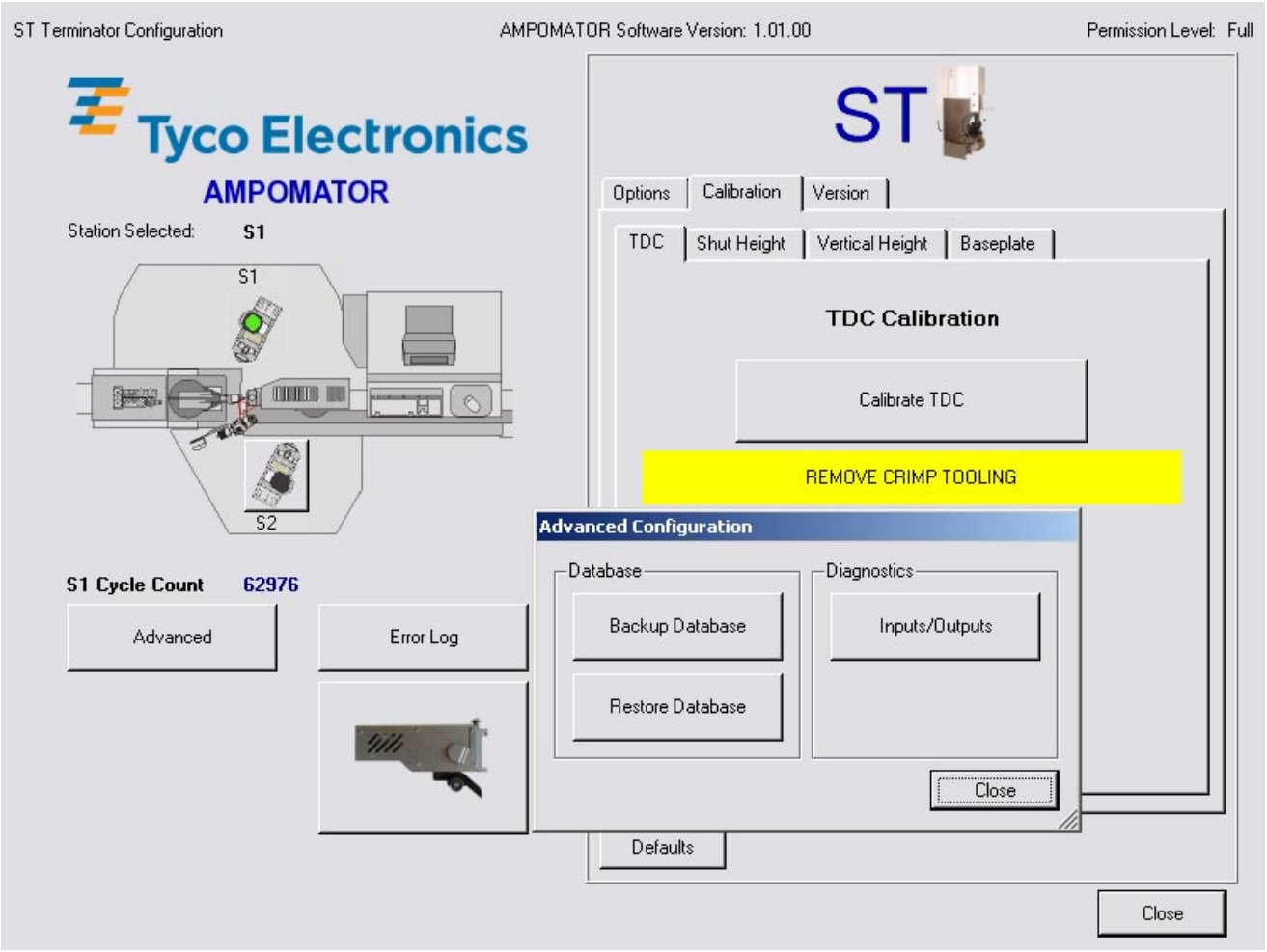


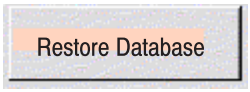
Figure 41

Cycle Count displays the total Life Time cycles of the selected terminator. This count is Read–Only and cannot be reset.

is used to backup the Tyco Electronics database that resides on the system. TopWin has a database that maintains all the parameters of the wire, terminals, seals, and articles. Likewise our system has a parallel database for the terminator specific terminal parameters. It is recommended that when you backup the TopWin database you perform the same from within the Tyco Electronics

application. Simply select 

and choose the folder or drive where you want the backup to be stored.



is used to restore a saved copy of the Tyco Electronics database. If you restore the TopWin database, you must restore the Tyco Electronics database or all of the terminator specific terminal parameter may be reset to default. Simply select 

and choose the folder or drive where the backup resides.

is used for diagnostics of the various inputs, sensors, outputs, and signals that reside within the terminator. Only authorized personnel should access this section. This screen shows all of the I/O points and their status. Green for ON, Red for OFF. The status of the Inputs is dynamic, in that if you actuate a switch, the status of that switch will change on the display. The status of the Outputs can be changed simply by clicking on the indicator.

When changing the state of the outputs, motion on the terminator may occur at the selected output.

is used to view a Log that is created by the Tyco Electronics application (see example below). This will list all of the messages that have occurred, by log date, that are specific to our application. As with the two parameter databases in the system, the error log is similar. This will only list the Tyco Electronics messages, any TopWin messages are listed in the TopWin log. This log is not terminator specific. It shows all of the messages that have occurred on any Tyco Electronics station or from within the Tyco Electronics application. See Figure 42.

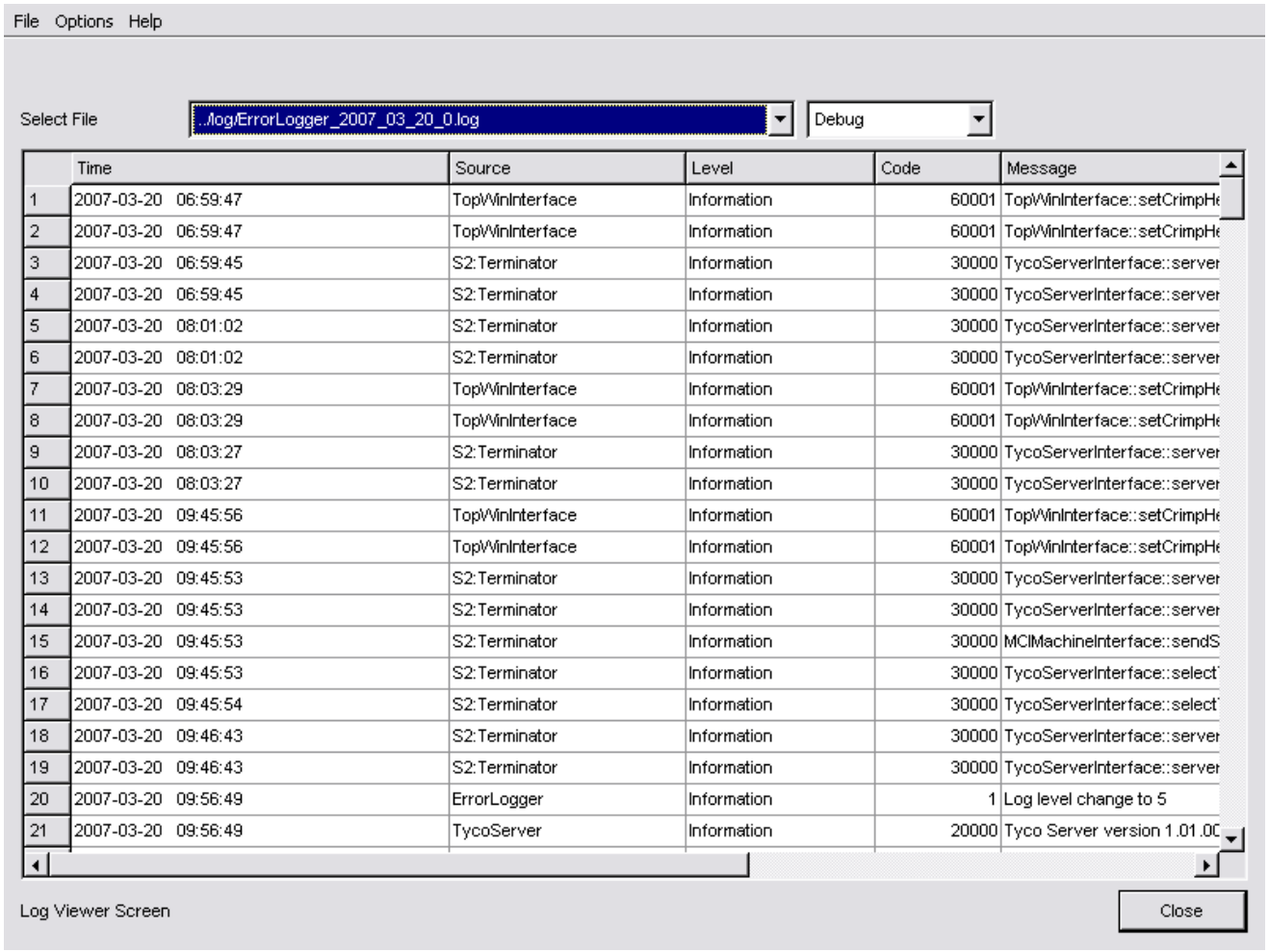
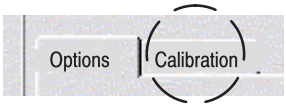


Figure 42

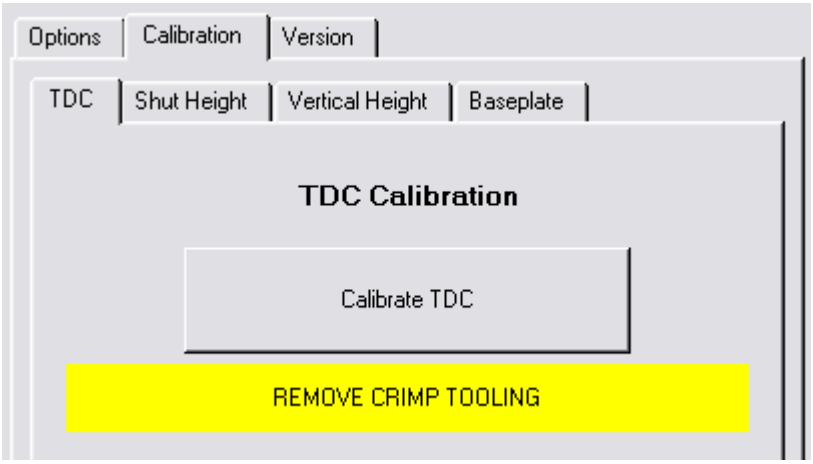
Once a terminator is installed on the machine, any options that are part of the terminator must be enabled for the system software to operate correctly. Simply check the Installed terminator option as needed. The options that are available on the ST terminator are: paper takeup, dereeler, scrap chopper, and air–feed.



The calibration tab provides the necessary methods to properly configure and calibrate the various parts of the ST terminator. The processes to follow for each of these calibrations are described in full detail in the Calibration Section of the customer manual.

DANGER

Only trained and qualified personnel should attempt any of these calibration procedures. Certain processes required additional alignment gages that may need to be purchased separately.



This screen is used to program the settings of the terminator for the selected terminal. This screen is accessed from the ST Setup button located on the TopWin terminal editor, Process Tab. For reference purposes this screen shows the Terminal ID that is being edited. For any option to be used, it must first be installed and configured for the terminator as noted in the previous section.

AMP–O–LECTRIC ST Definition Screen (Figure 43)

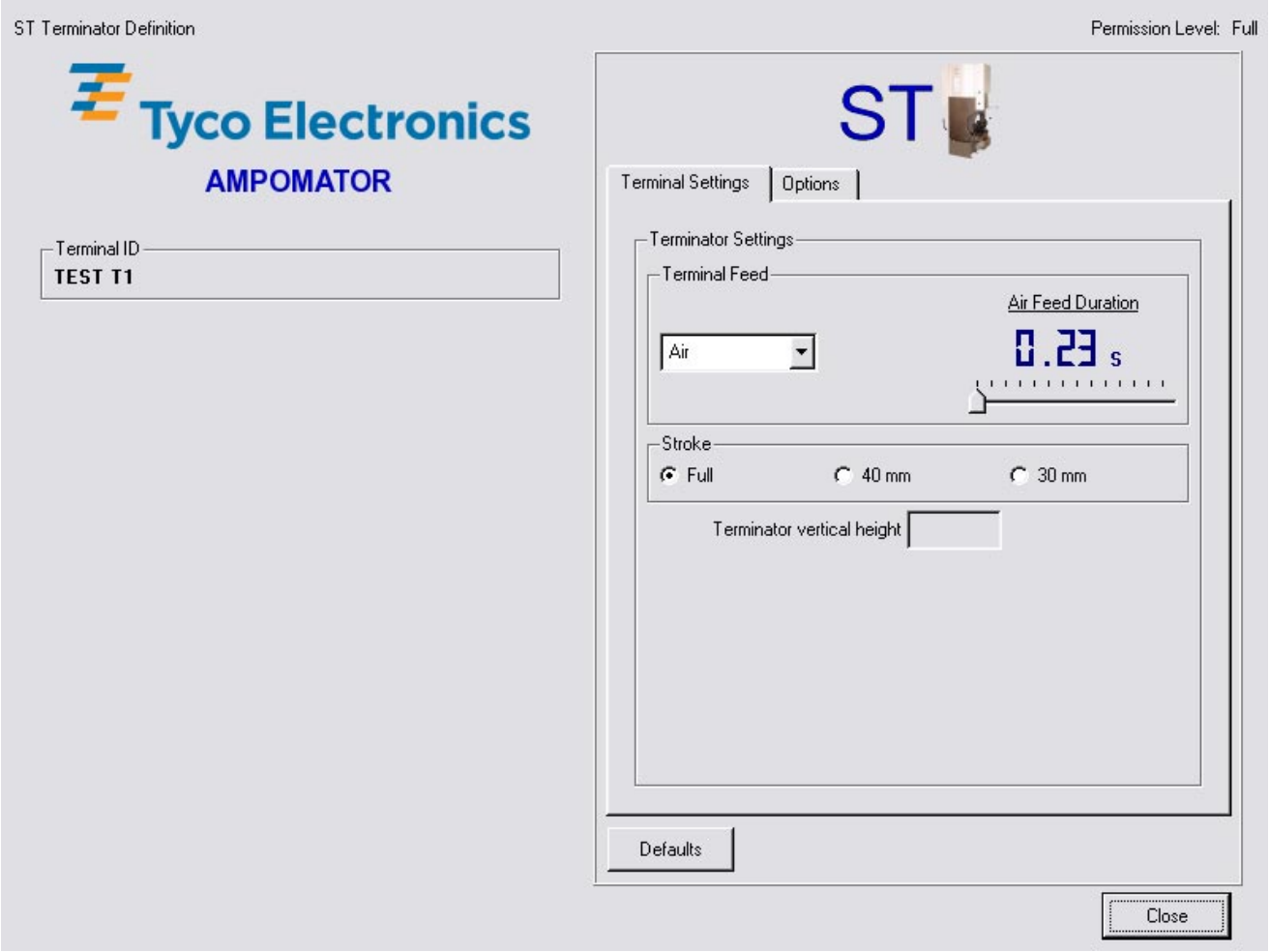


Figure 43

Terminal feed is a drop down selection box. The choices are **mechanical–feed** or **air–feed**. If air–feed is selected, an additional setting will be available that allows you to select the duration of time that the air feed cylinder is turned ON. You may need to increase this time if you have an applicator that has a very long feed pitch.

Air Feed Duration: 230 – 490msec (default 230msec)

The **stroke** of the terminator, or the distance the ram moved up and down, can be easily selected by clicking on the appropriate choice. The available choices are **full stroke** (41.28 mm, 1 5/8”), 40 mm, or 30 mm stroke. When operating at a stroke other than full stroke the terminator alternates its motor direction to achieve the shorter stroke. With this action, the crimp monitor requires the number of “learn cycles” to be double the standard amount (the number of “learn crimps” is entered in TopWin).

The **paper takeup** option can be turned on by checking the Paper Takeup box. When the option is ON a **Delay Off** selection can be made in 1.5 – 5.0 seconds, (the default is 1.5 seconds). **Delay Off** is the number of seconds the **paper winder** will continue to run after the dereeler or terminator (if no dereeler is installed) stops.

The **power dereeler** option can be turned on by checking the Dereeler box. When the option is on, the direction (either clockwise or counterclockwise) can be selected. See Figure 44.

The dereeler also has Error Detection capability. The two choices are:

Snag Detection Time (Figure 44)

If the start switch on the terminal deflector is made for more than the set time a “snag detected” error will appear on the display. After the terminal reels are corrected as necessary, the error can be cleared and production resumed. The Snag Detection Time can be set: 0.5 – 5.0 seconds (default 0.5).

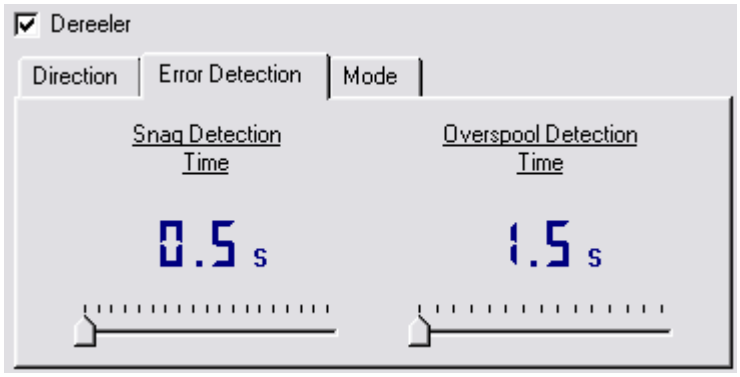


Figure 44

Overspool Detection Time (Figure 44)

If the stop switch on the terminal deflector is not made within the set time after the start switch is made, the warning “overspool detected” will appear on the display. Production will not be interrupted. The **power terminal dereeler** will resume unwinding terminals when the start switch is made again. Only after making any changes necessary to assure the terminal deflector returns to its rest position and repeatedly makes the stop switch, should the warning be cleared. Overspool Detection Time can be set: 1.5 – 5.0 seconds (default 1.5),

The dereeler also has a **low tension mode**. In the normal mode, the dereeler motor runs when the start switch is made and stops when the stop switch is made. When set to **low tension mode**, the start switch is ignored and the dereeler motor runs whenever the stop switch is not made. Snag detection is disabled in this mode. **Low tension mode** is used whenever there is insufficient terminal deflector motion. It can also be used to decrease maximum terminal strip tension. Although this is usually caused by long pitch terminals (in excess of 1.0” [25 mm]), there are combinations which may necessitate using **low tension mode.** (A side–feed UltraPod applicator with terminal lubrication installed on side one is an example.) It is recommended to use **low tension mode** only when necessary in order to extend the life of the gear motor and retain snag detection capability. See Figure 45.

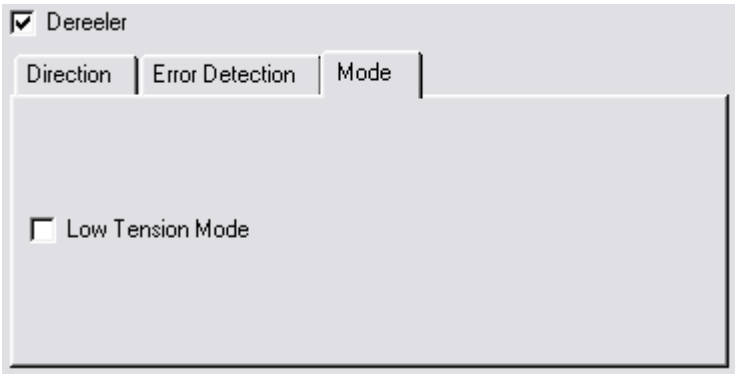


Figure 45

The scrap chopper option can be turned ON by selecting a number for the **Scrap Chopper Chop Count** that is greater than 0. This number determines how many crimp cycles are run for each chop of the carrier. This can be set from 0 – 9 cycles per chop. (0 is OFF; any other number the option is ON). See Figure 46.

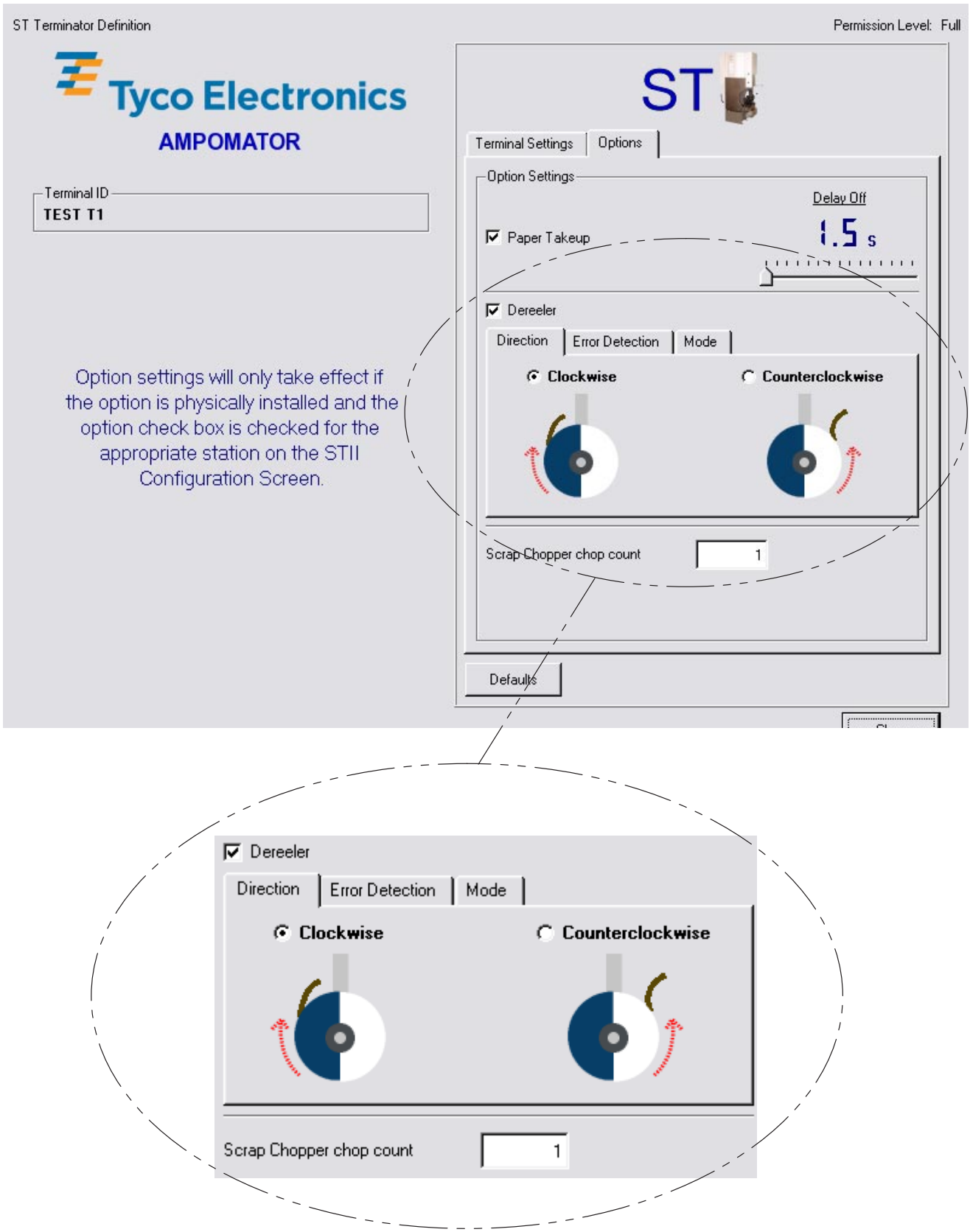

ST Terminator Definition
Permission Level: Full
Tyco Electronics
AMPOMATOR
Terminal ID
TEST T1
Option settings will only take effect if the option is physically installed and the option check box is checked for the appropriate station on the STII Configuration Screen.
ST
Terminal Settings
Options
Option Settings
Delay Off
Paper Takeup
1.5 s
Dereeler
Direction
Error Detection
Mode
Clockwise
Counterclockwise
Scrap Chopper chop count
1
Defaults
Dereeler
Direction
Error Detection
Mode
Clockwise
Counterclockwise
Scrap Chopper chop count
1

Figure 46

4.2. Converting Applicator Types (Figure 47)

DANGER

To prevent personal injury, power down the machine before performing conversions.

A. Dedicated–Style Applicator Conversions

If a servo terminator needs to be converted to a different dedicated applicator style, refer to conversion kit assembly drawing 1901578 for the appropriate kit part number and additional information.

To convert from one dedicated applicator style, proceed as follows:

1. Disconnect the force sensor cable from the CQM box.
2. Using a 3 mm hex wrench, remove the force sensor cable relief mount from the servo terminator side plate.
3. Using a 4 mm hex wrench, remove the ram adapter assembly from the servo terminator ram.
4. Loosely install the new ram adapter assembly to the servo terminator ram.
5. Install the force sensor cable relief mount to the servo terminator side plate.
6. Connect the force sensor cable to the CQM box.
7. Refer to conversion kit assembly drawing 1901578 and exchange baseplate latches as necessary.
8. Refer to IS 408–10093 (Using Alignment Gage 1901545–1) and align the baseplate to the ram adapter.
9. Refer to IS 408–10095 (Using Shut Height Gage 679655–[ ]) and set the servo terminator shut height.
10. Using Terminator Positioning Gage 1752499–1 , refer to Paragraph 4.3, Defining Terminator Position (Relative to Wire Transfers) and verify the terminator position.

B. Quick–Change Style Applicator Conversions

If a servo terminator needs to be converted between quick–change type applicators regularly, refer to conversion kit assembly drawing 1901578 for the appropriate kit part number and additional information (including special applicators).

To convert from one applicator style to another, follow these steps :

1. If applicable, install or remove the appropriate ram converter post. Converter posts require using either a 17 mm or 11/16” open end wrench.

NOTE

Note that the JAM / Delphi (4.705 In. Shut Height – STD) post is longer than the Delphi (4.732 In. Shut Height – Special) post.

CAUTION

Damage to the ram adapter assembly may result from over tightening converter posts. Refer to the appropriate ram adapter assembly drawing (1804609 [SLE JAM] / 1804610 [SLE AMP HDM] / 1901660 [SLE HDM+] / 1752450 [JAM/Special Delphi]) for maximum allowable torque.

2. Using a 3 mm or 4 mm hex wrench, refer to conversion kit assembly drawing 1901578 and exchange baseplate latches as necessary.

   a. If converting to AMP HDM or Delphi (with AMP HDM style baseplate), refer to 408–10093 and adjust the pocketed right hand latch. Note that the Delphi (with AMP HDM style baseplate) pocketed right hand latch is narrower than the AMP HDM latch.

   b. If converting to bench tape feed latches, please note that the “T” clamp must be loosened using a hex wrench every time prior to removing or installing a bench tape feed applicator.

c. If converting to Ultra–fast AMP HDM, the left front latch may need to be repositioned as shown in the 1901578 drawing.

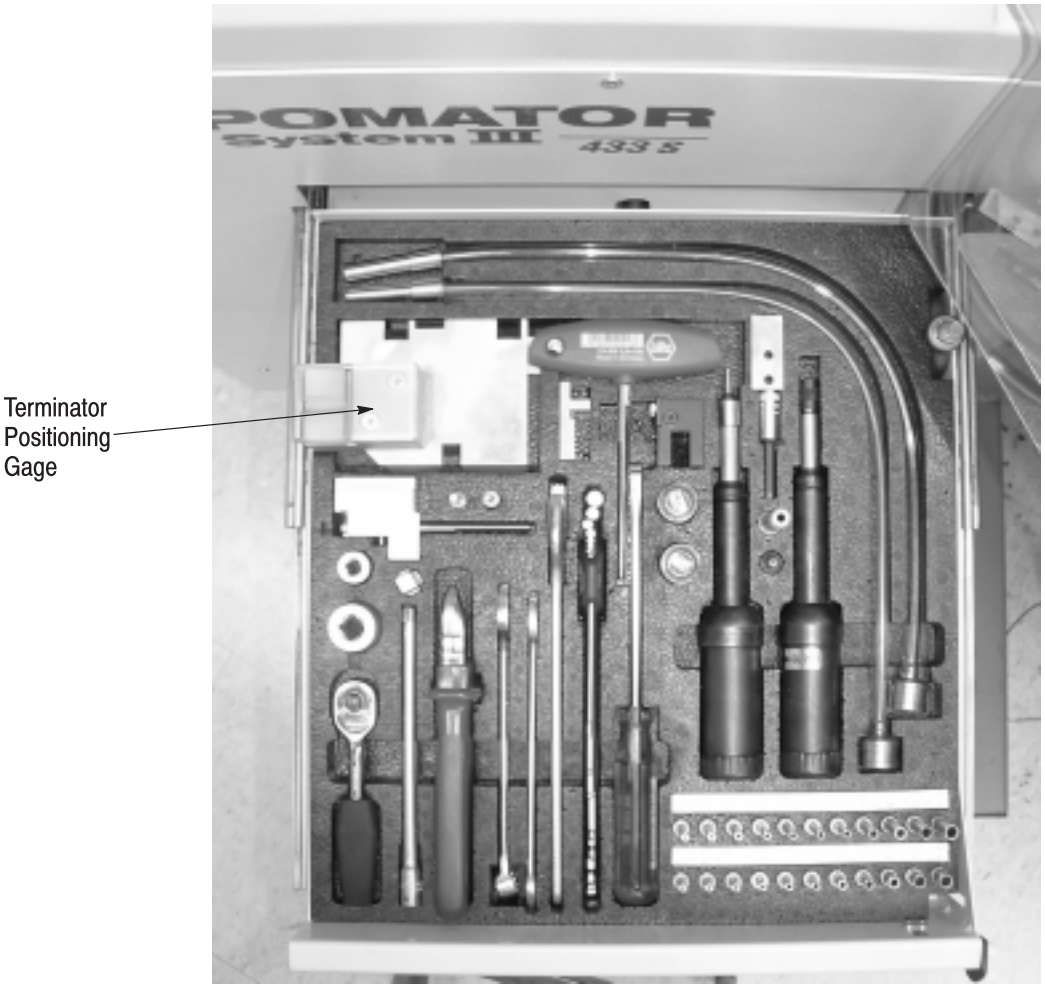


Figure 47

3. The ram to baseplate alignment may be checked with the optional 1901545–1 alignment gage. Refer to 408–10093 for additional information.

4. AMP HDM and JAM terminator shut–heights may be verified with optional shut height gages 679655–2 (for AMP HDM) and 679655–3 (for JAM). Refer to 408–10095 for additional information.

5. The terminator position may be checked using the 1752499–1 Terminator Positioning Gage supplied with the AMP–O–MATOR System III machine. Refer to Paragraph 4.5, “Defining Terminator Position” (See Figure 47 for gage storage location.)

4.3. Top Dead Center (TDC) Adjustment

Terminator Top Dead Center calibration is performed to find the start points for the various terminator strokes. This process should be performed if any portion of the drive train or crimp height mechanism is adjusted or disassembled. Information about each terminator is stored so that mechanical inconsistencies between terminators are “zeroed out.”

Adjust as follows:

1. Remove applicator.

2. Use TopWin to power up and “Reset” the machine with the guards closed.

3. Press the “ST” icon on TopWin. Refer to Figure 48.

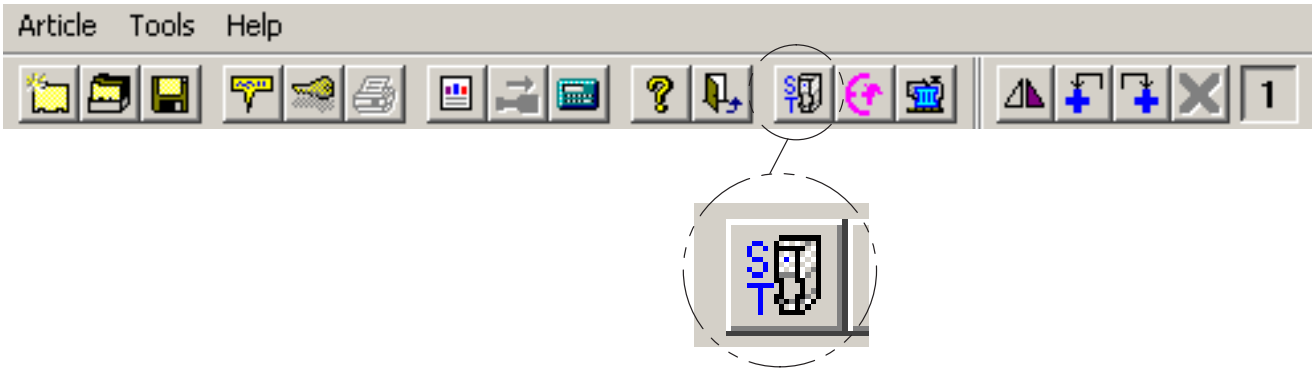


Figure 48

4. Select the terminator.
5. Select the Calibration tab.
6. Select the TDC tab.
7. Select the “TDC Calibration” button. Refer to Figure 49.

The top dead center calibration will now be made. The process will take several minutes; wait until there is confirmation that the process has completed.

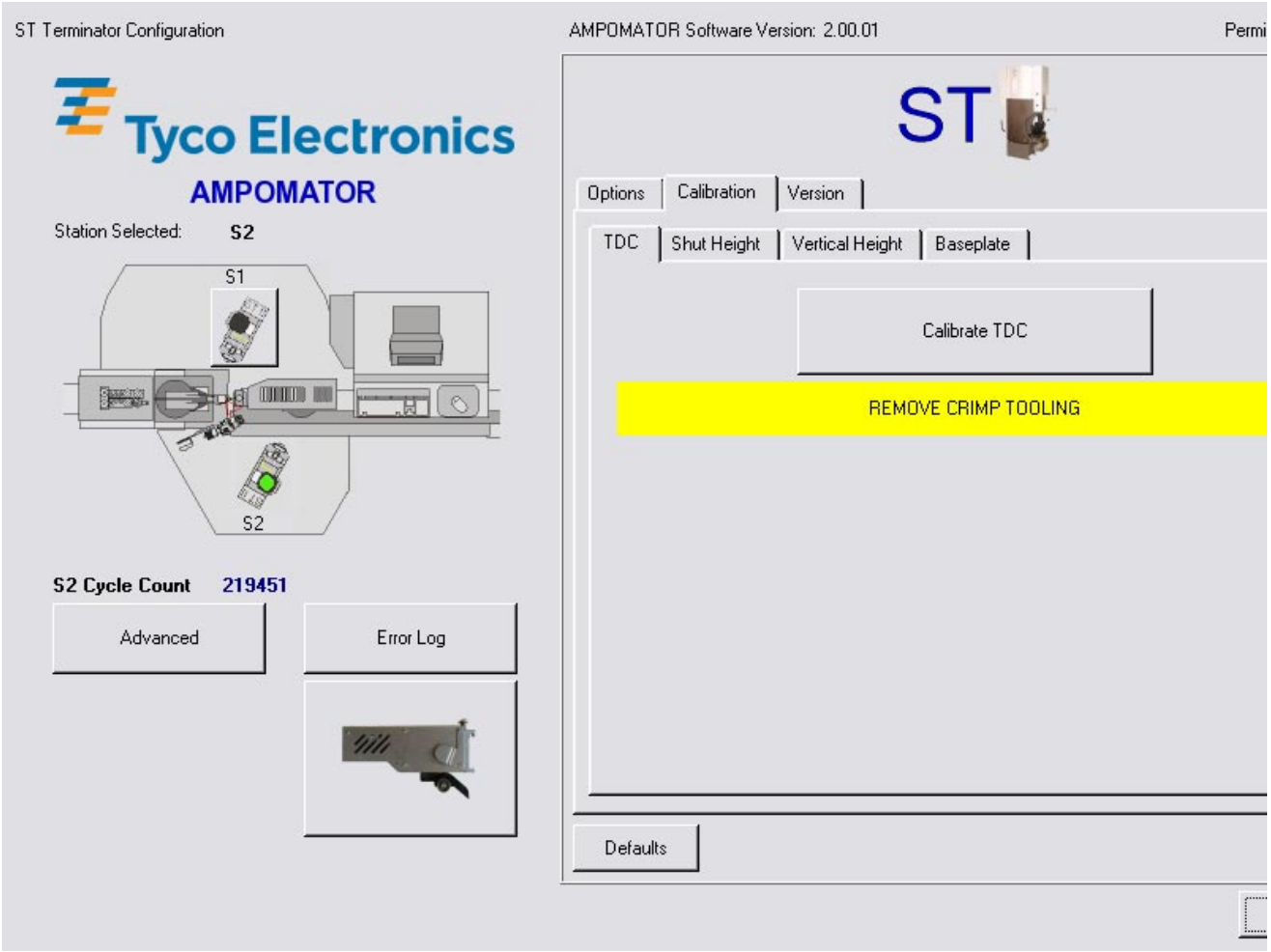


Figure 49

8. To perform the shut height, see 408–10095 (or the information provided with the SLE CM gage.)

4.4. Terminator Vertical Height Adjustment

Terminator vertical height calibration is done to set a nominal vertical position of the terminator with respect to the wire centerline. Machine dimensional inconsistencies create the need to zero the vertical height so that applicators can be transferred between terminators with little adjustment.

Perform the vertical height calibration as follows:

1. Close the machine guards.
2. Stop (E–Stop) the leadmaker.
3. Turn on and “power up” the leadmaker— but do *NOT* reset it.
4. Remove wire from leadmaker.
5. In the setup tab of TopWin click “Machine Configuration” window.
6. Select the “Swivel” tab. See Figure 50. Then press the “Swivel 1” or “Swivel 2” button.

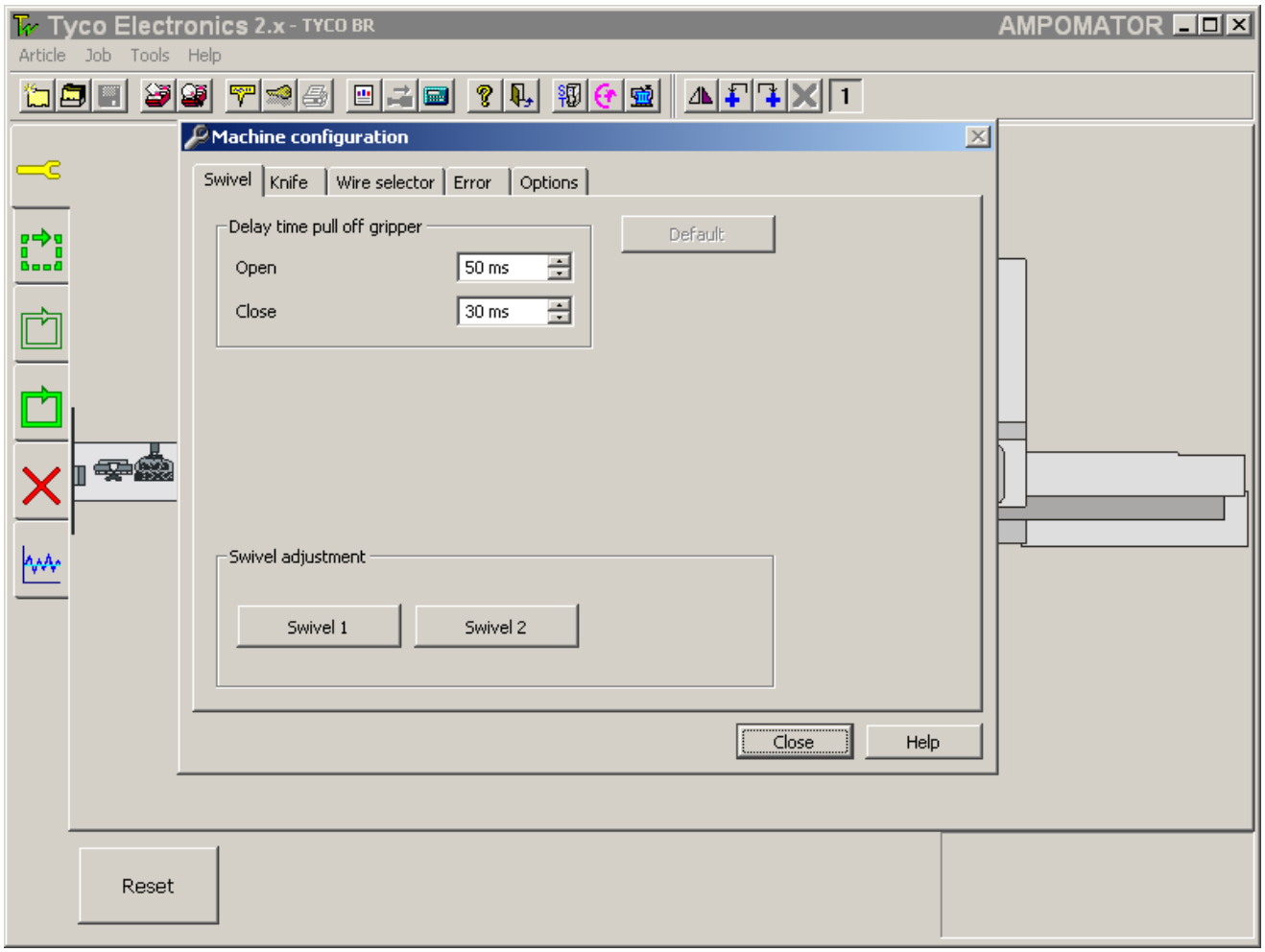


Figure 50

7. Open the machine guards. The “Save” and “Cancel” buttons (Figure 53) on the machine configuration tab will change to grey.

8. Install the 1.3 mm diameter 39.5 mm long guide tube in Side 1 (Figure 52) or setup in No. 7 in Side 2 (Figure 51).

NOTE

Use a 3 mm hex wrench to pry the jaws open while installing the setup pin. Refer to Figure 51.

Figure 51

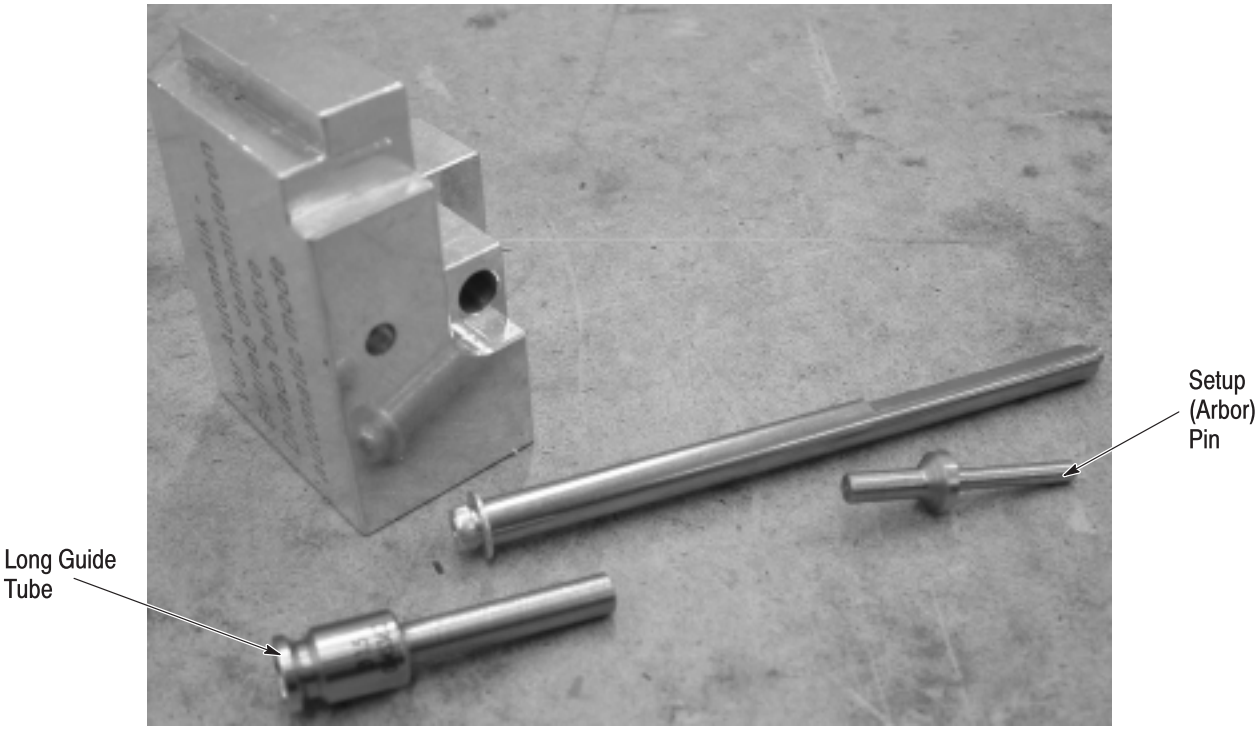


Figure 52

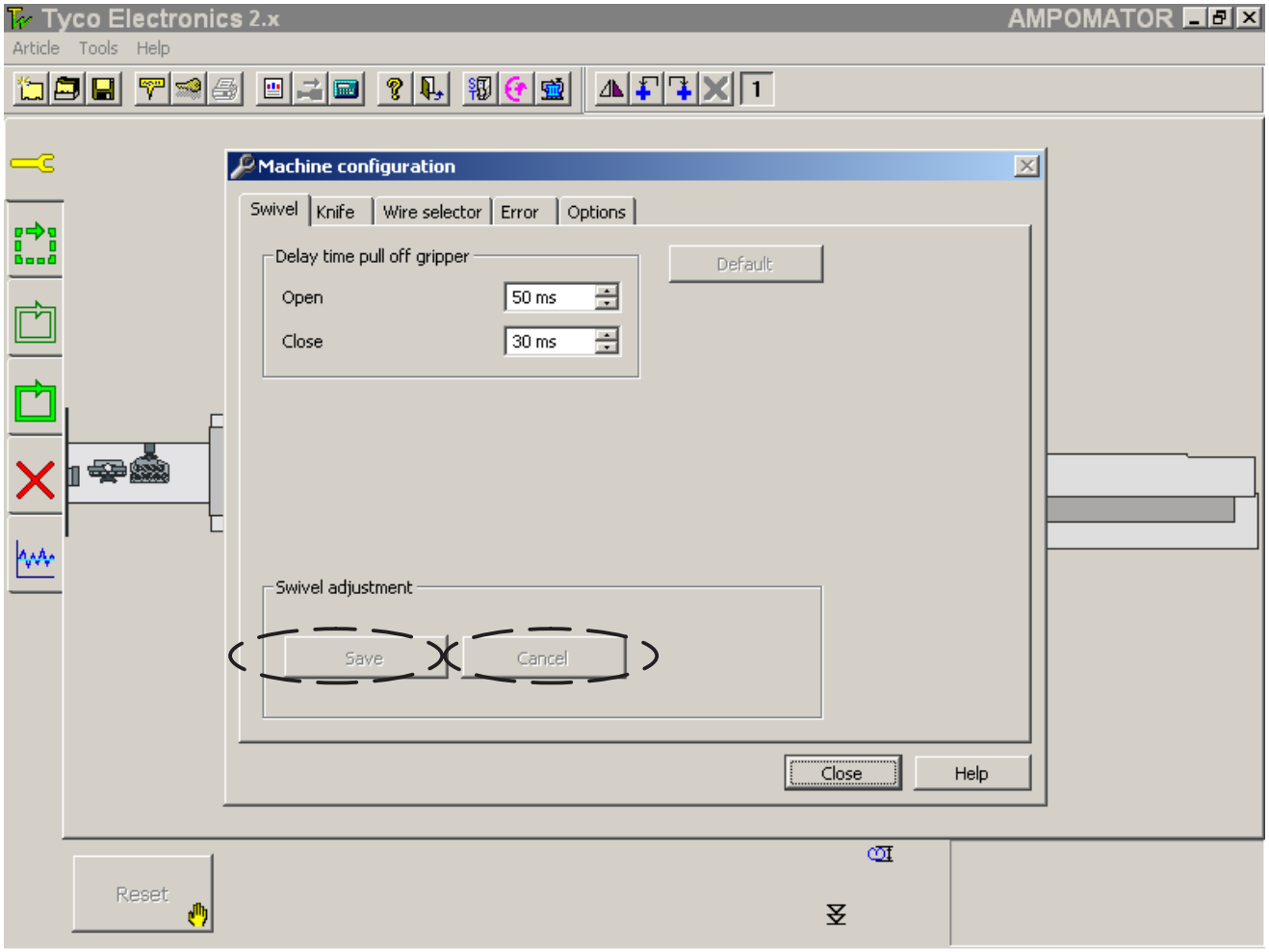


Figure 53

9. Close the “Machine Configuration” window.
10. Press ST button on TopWin.
11. Select the terminator.
12. Select the “Calibration” tab.
13. Press vertical height “Calibration”button. (Figure 54 illustrates screen.)

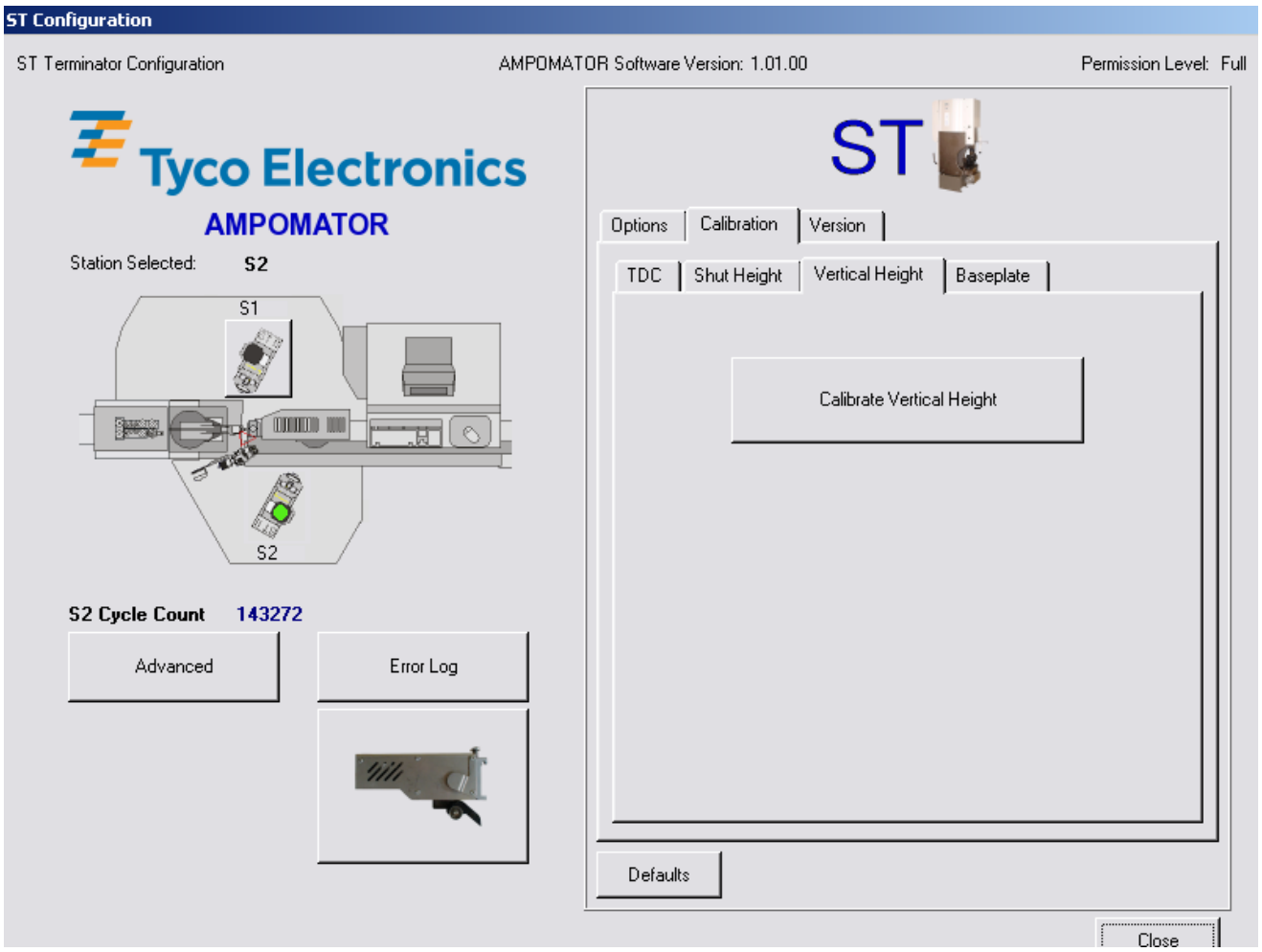


Figure 54

14. Install the vertical height calibration gage as shown in Figure 55.

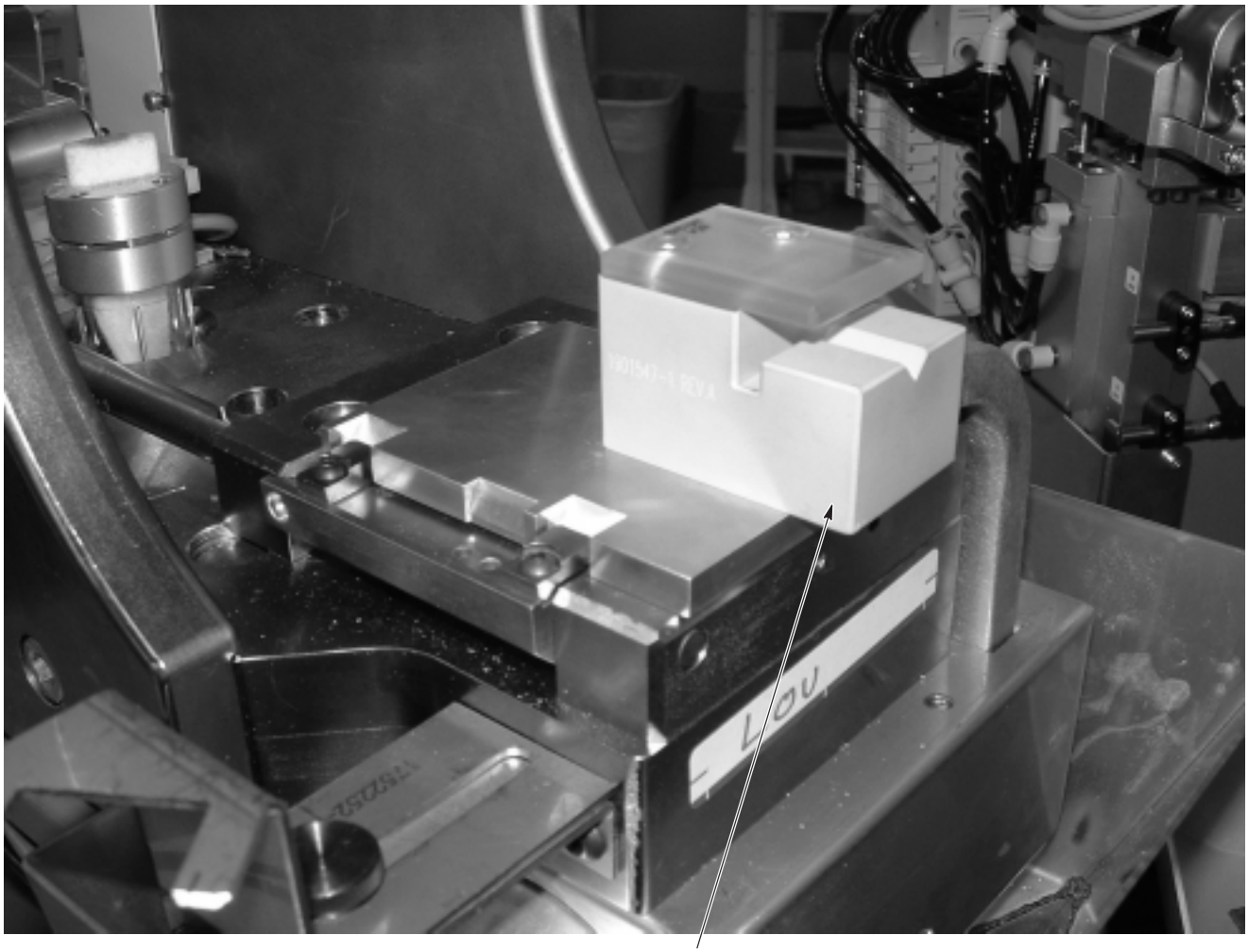


Figure 55

15. Swing the arm over.

NOTE

The software allows you to go to the current Vertical Height Calibration Position when you are in the Vertical Height Calibration mode.

This is accomplished by entering the Vertical Height Calibration Mode then pressing the confirm key and the Jog Full button. The terminator will move to the current calibration position. This can be used to verify that it is set properly or as a starting point to adjust it.

16. Use the up and down button until the terminator height is aligned with the gage (as shown in Figure 56).

NOTE

The adjustment increment is 0.5 mm [.02 In.].

NOTE

When properly adjusted, you should feel a slight drag as the swivel arm swings under the polycarbonate cap of the calibration gage.

Terminator Height Aligned With Gage

Figure 56

17. Press the “Apply” button to save the vertical height.
18. Exit out of calibration mode.
19. Exit out of ST Window
20. Abort the error.
21. Drop the pin using the E–Stop.
22. Remove the calibration gage.
23. Reinstall the wire.

4.5. Defining Terminator Position Relative to Wire Transfers (Terminator Location Calibration)

The location of each terminator must be properly learned so that interchangeability of applicators is possible.

1. E–Stop the leadmaker.
2. Turn on and “power up” the leadmaker.
3. In the setup tab of TopWin click on the terminator to set its location.
4. Press the “next arrow” icon to go to the positioning screen.
5. Press and hold the “Confirm” button while selecting the “Reset” icon.
6. Press the “Positioning” icon in the “Commands” section of the screen.
7. Press and hold the “Confirm” button while selecting the “Feed in Wire” icon.
8. Press and hold the “Confirm” button while selecting the “Cut” icon.
9. Select “Turn to Station.”

10. Install the Calibration Gage (Figure 55).

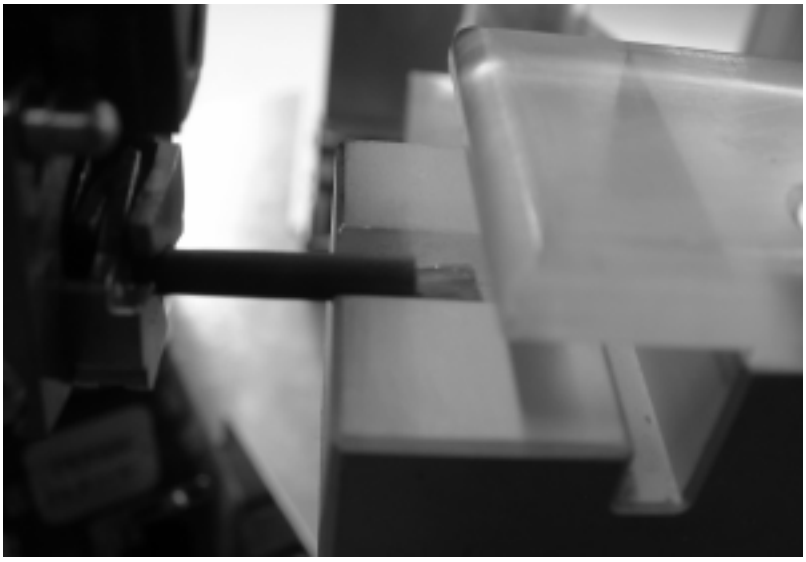
11. Using the wire and arrow controls, align the swivel to the calibration gage mounted in the terminator. See Figure 57.

NOTE

It is acceptable to push the swivel down to check the wire-to-gage alignment.

Aligning the Swivel to the Calibration Gage

Aligning the ***Angle*** →



Aligning the ***Radius*** →

Figure 57

12. Save the “Current Position” when the terminator is properly aligned.

13. Press the next arrow and the “Finish” icon to complete alignment procedure.

5. SYSTEM III SERVO TERMINAL FEEDER PRE-PRODUCTION SETUP

5.1. System III Feeder Installation

Installation hardware for the feeder assembly consists of the items in Figure 58.

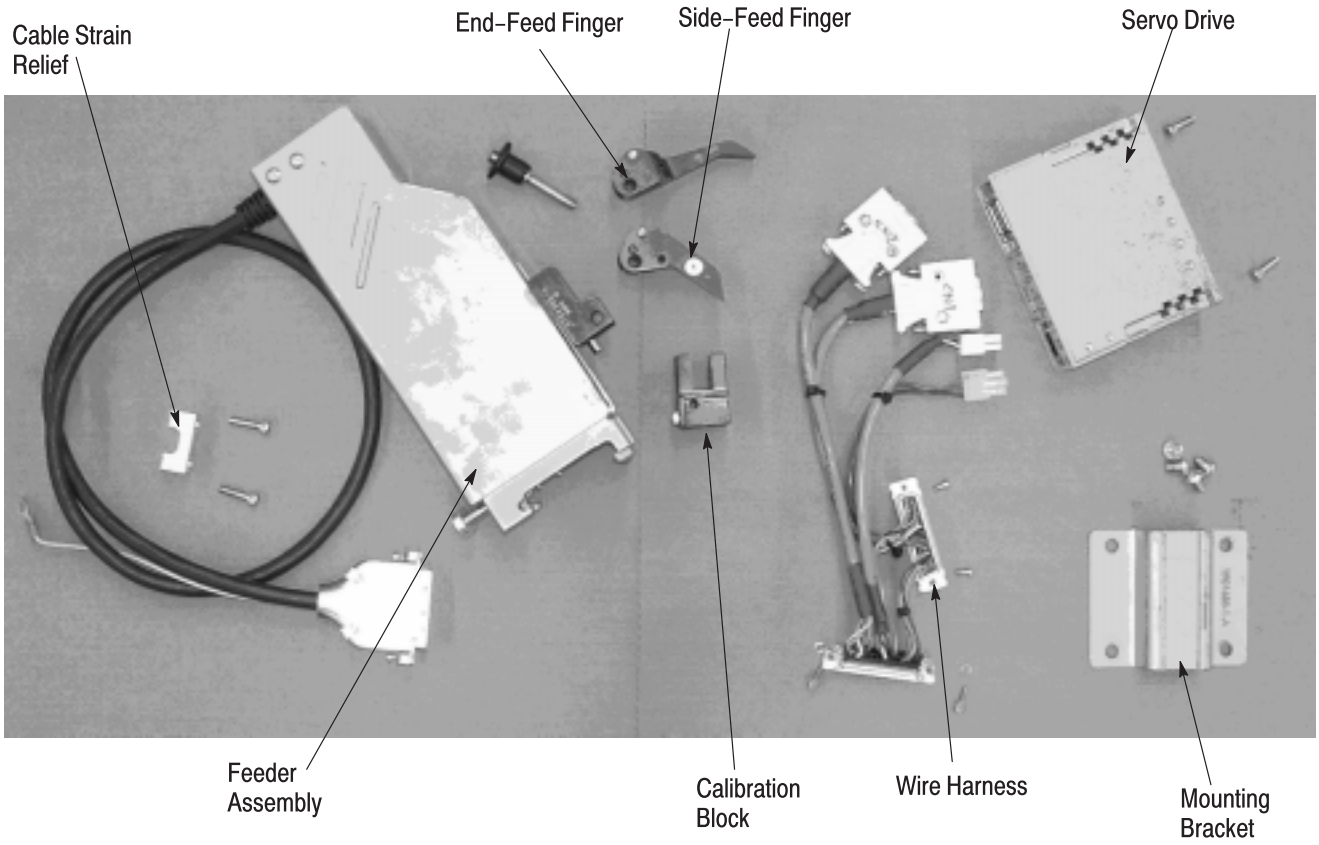


Figure 58

1. Raise the machine guard and disconnect the electrical power and air supply from the machine.
2. Remove the top and rear covers from the terminator, as well as the eyebolt (see Figure 59).

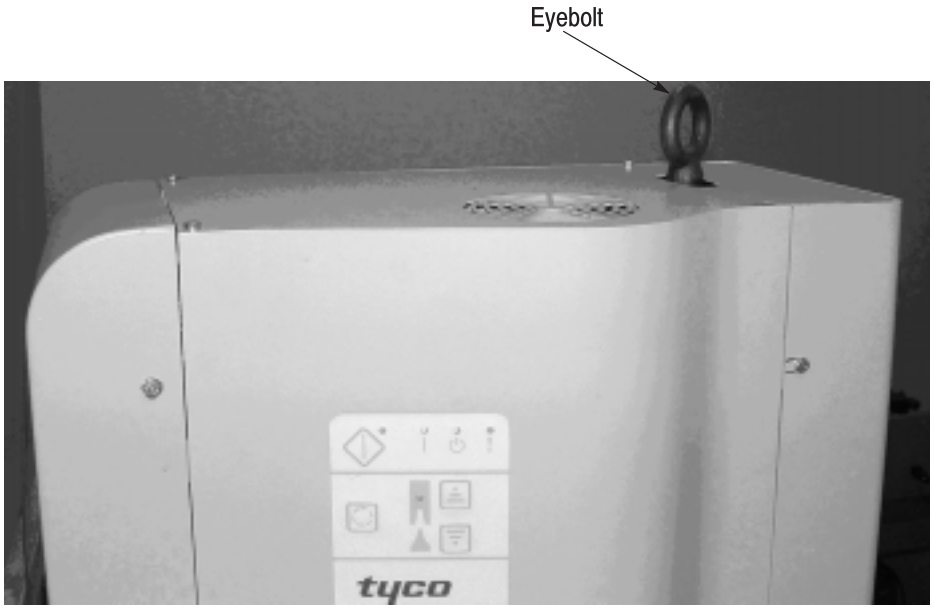


Figure 59

3. To remove the side cover, first remove the electrical panel mounting screw (Figure 60) and remove the three additional mounting screws (Figure 61).

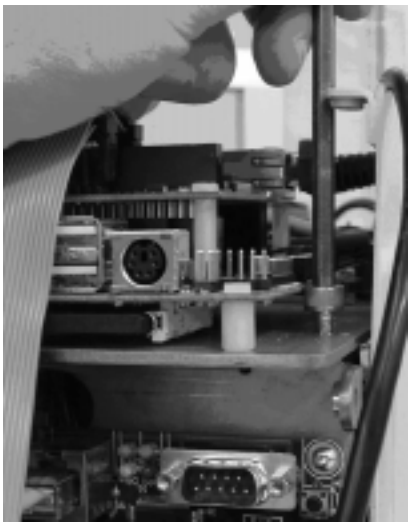


Figure 60

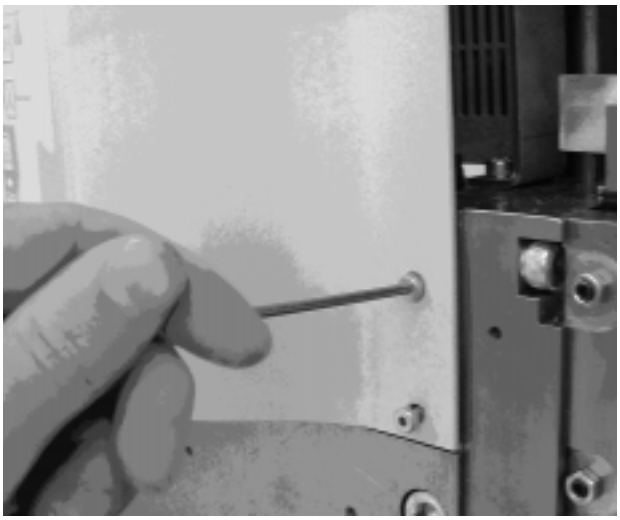


Figure 61

4. Disconnect the keypad ribbon–cable from the circuit board (Figure NO TAG).

5. Connect the wire harness to the servo amp (Figure 62). Make sure to properly connect the CN2/PG and CN1/I0 connectors since they are interchangeable. See Figure 63.

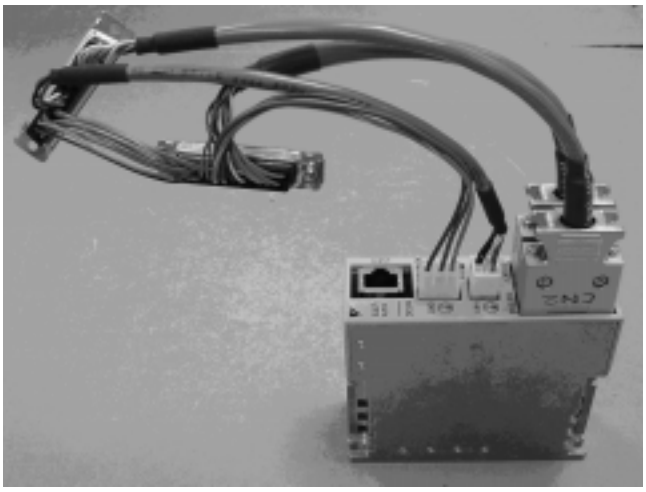


Figure 62

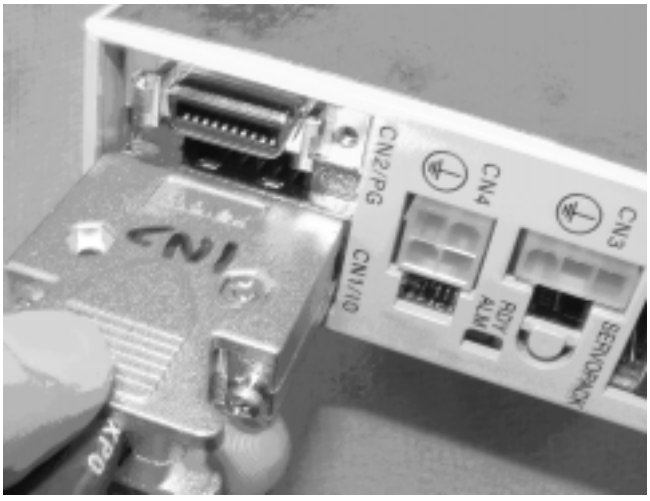


Figure 63

6. Position the wire tie (Figure 64). Mount the servo amp unit to the electrical panel using two M4 x 5 mm screws.

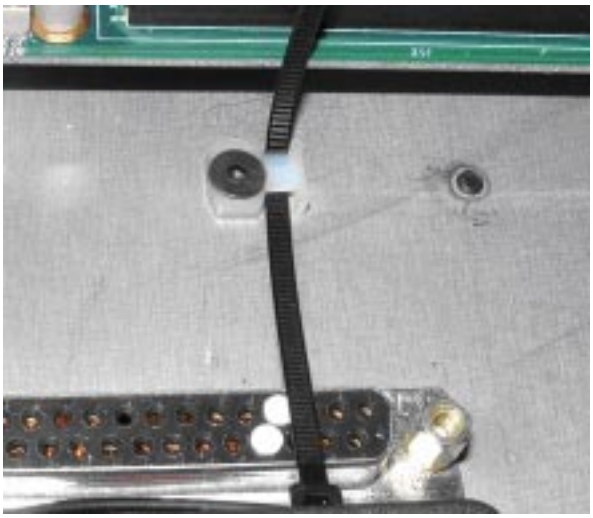


Figure 64

7. Using a straight–bladed screw driver, install the wire harness connector to the electrical panel (Figure 65).

8. Secure the wires with the provided wire ties (Figure 66).

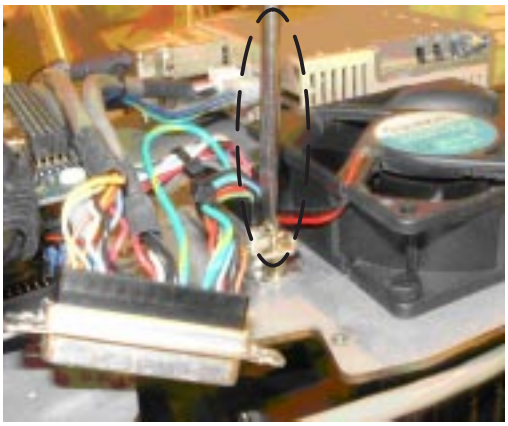


Figure 65

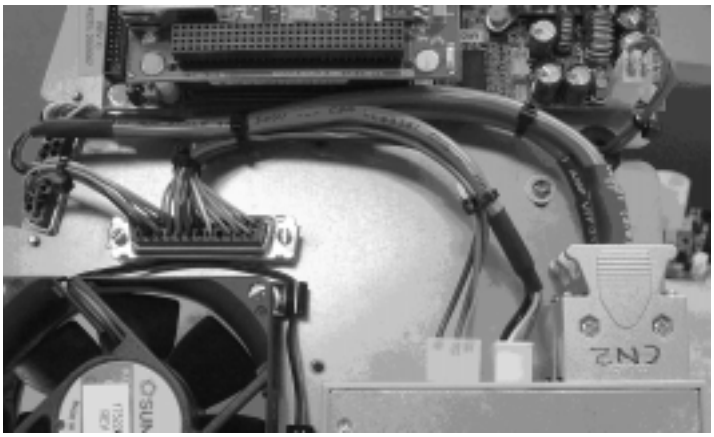


Figure 66

9. Securely attach the feeder connector to the harness using a straight–bladed screw driver (Figure 67).

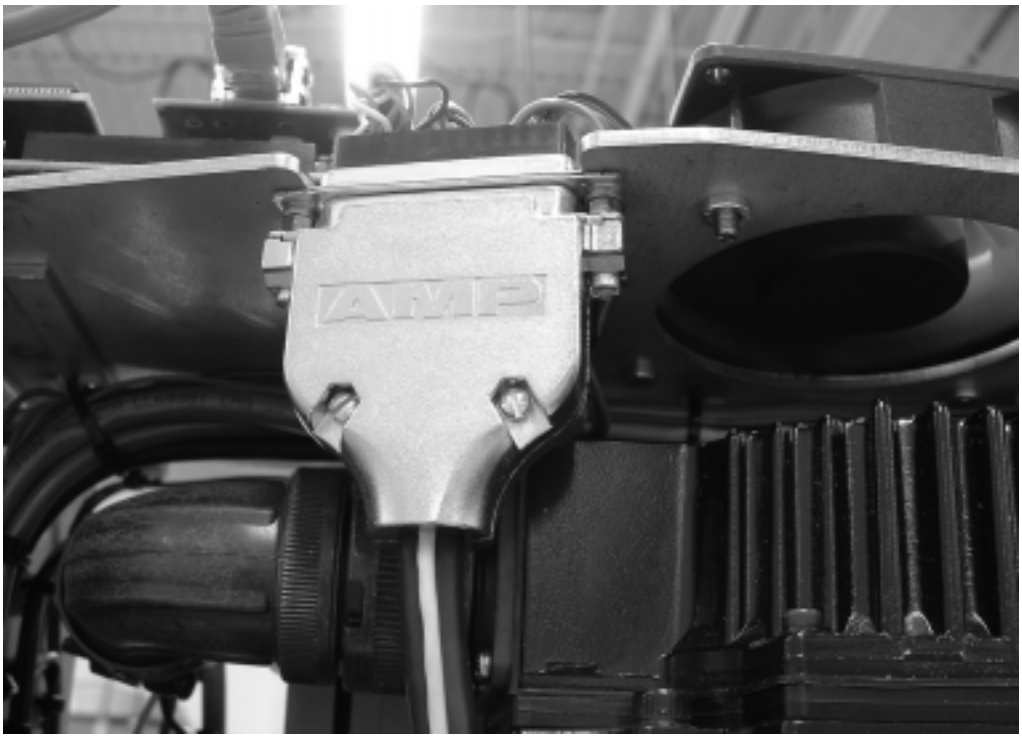


Figure 67

10. Attach the ground wire to the frame with the pre–installed ground screw (Figure 68)

11. Install the cable strain relief to the side plate using the two provided M4x10 socket head cap screws (Figure 69).

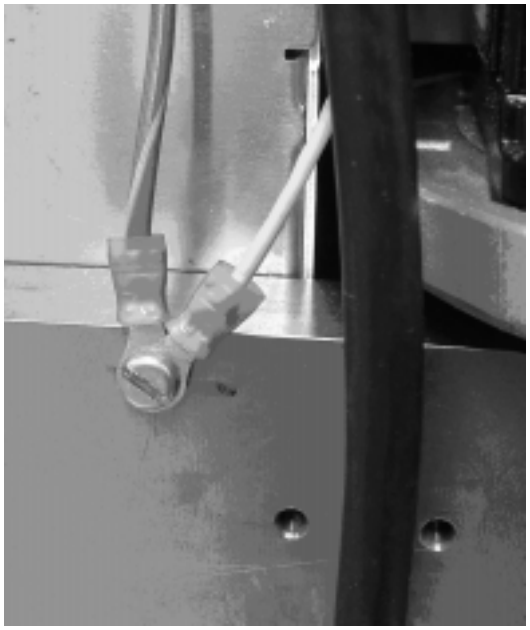


Figure 68

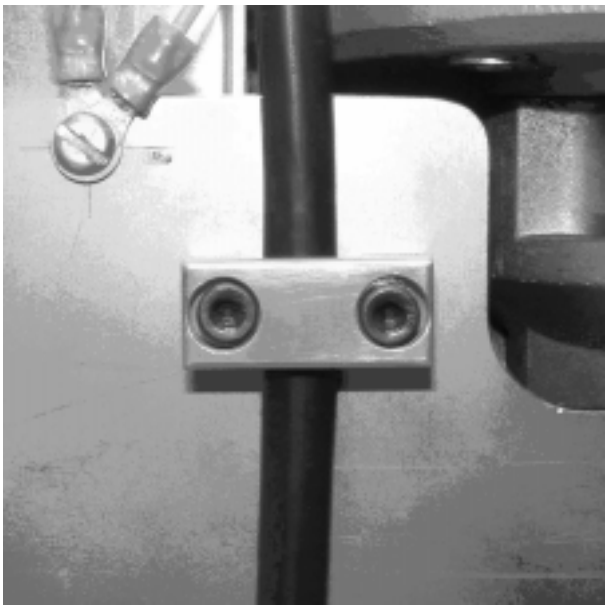


Figure 69

12. Install the feeder storage bracket to the side plate with four M5x10 mm button head cap screws as shown in Figure 70. Hang the feed unit (Figure 72).

NOTE

It is suggested the cord for the feeder be run through the center of the bracket to help keep the cord contained when using conventional feed applicators.

Figure 70

Figure 71

13. With the covers removed, install the feed finger storage pins to the side plate as shown in Figure 71.

14. Hang the feed unit as shown in Figure 72.

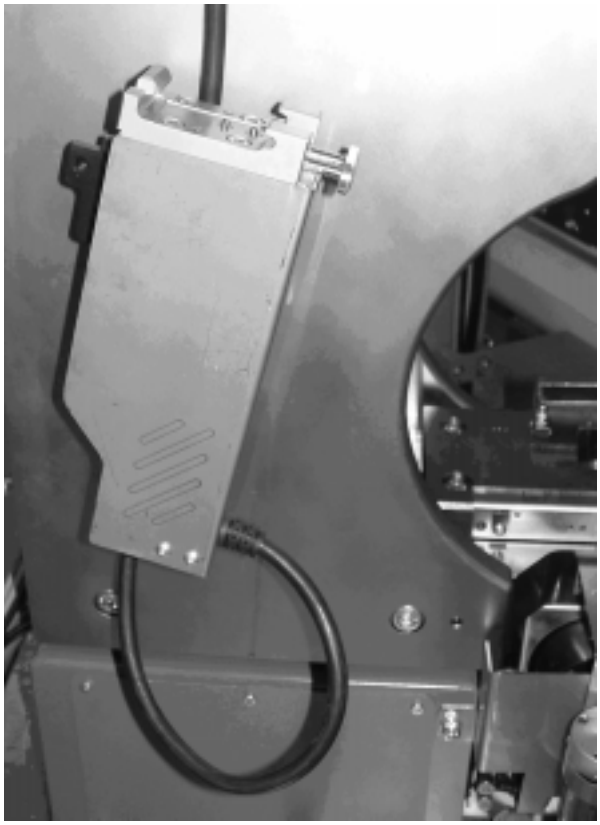


Figure 72

15. Reinstall the side cover making sure to reconnect the ribbon cable and the panel mounting hardware.

16. Install the top and rear covers.

17. Restore the machine power.

5.2. System III Feeder Setup and Calibration

To allow System III applicators to be used on multiple feeders, each feeder must be accurately calibrated. If the feeder is disassembled for any reason or moved from one terminator to another, it must be re–calibrated before use. An optional calibration gage is available (p/n 1901063–1).

1. Press the “ST” icon from the TopWin screen. See Figure 73.

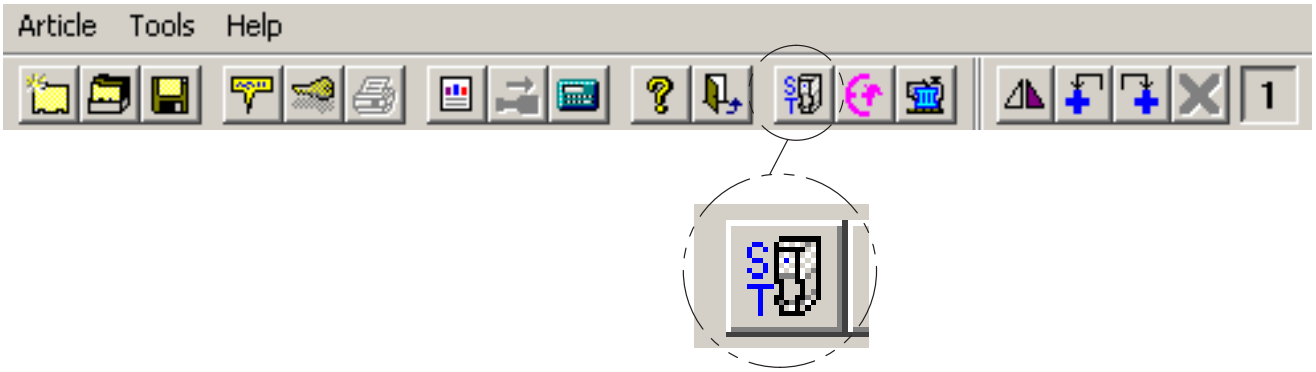


Figure 73

2. Select the required station (S1 or S2) to calibrate using the screen in Figure 74.

Figure 74

3. Select the feeder icon as shown in Figure 75.

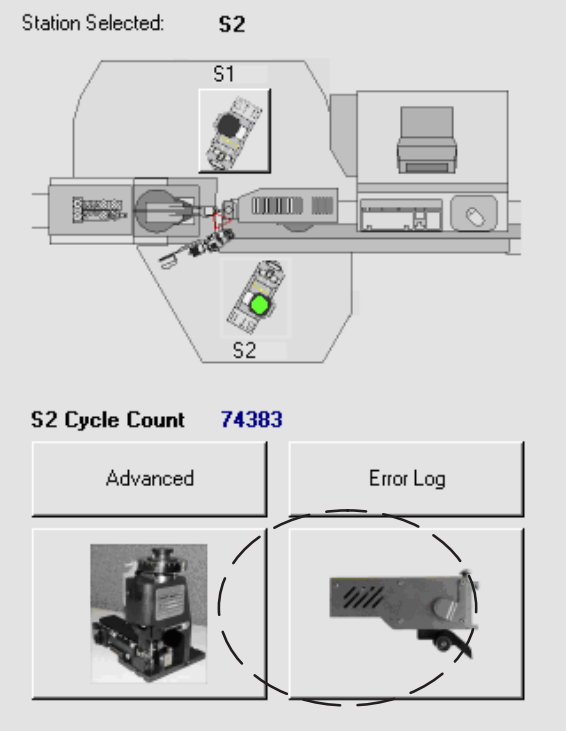


Figure 75

4. Remove feed finger from the feeder and close the guards.

5. Select the “Start” icon to begin the calibration of the feeder (Figure 76). Repeat for any other terminators.

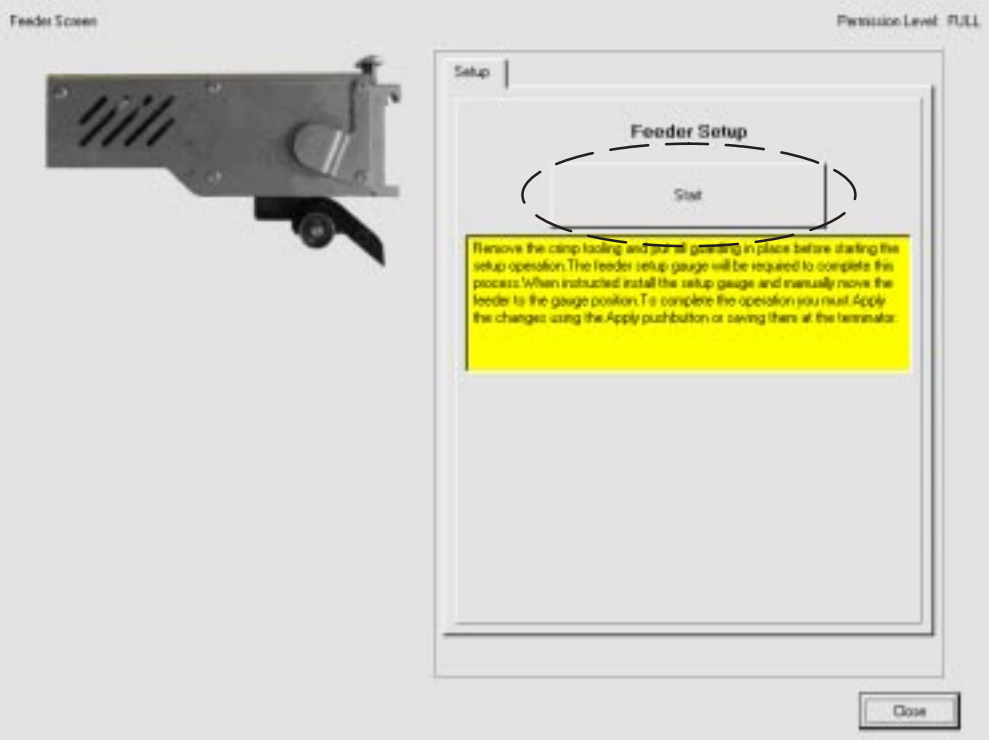


Figure 76

6. When the feeder calibration is complete, set the gage position.
   a. Raise the machine guards and install the gage block (see Figure 77).

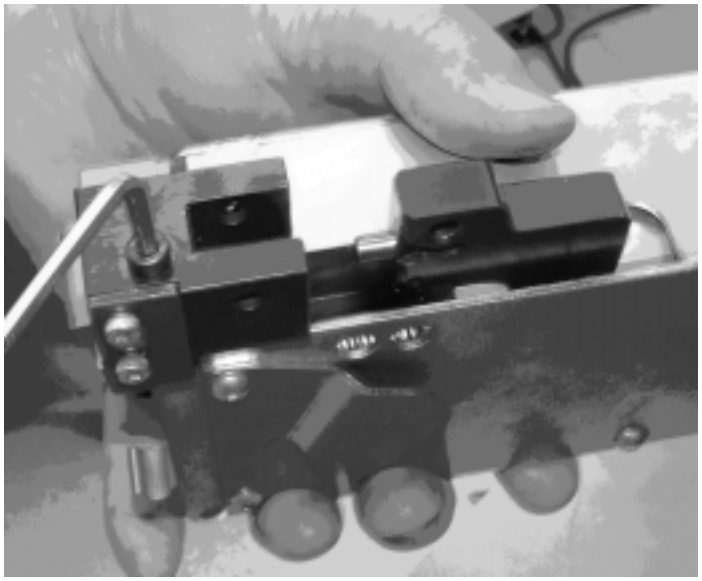


Figure 77

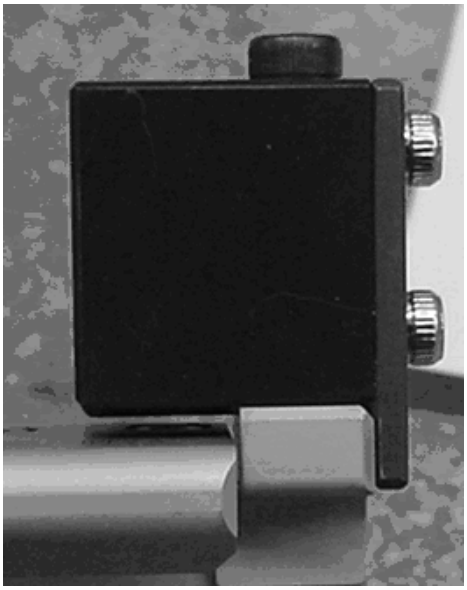


Figure 78

   b. Make sure that the gage block (flag) is tight against the side (Figure 78) and tight against the step of the feeder mounting bracket. Failure to consistently install the feeder block will result in inaccurate feed position between feed units.

7. If the feed arm does not enter the gage block (Figure 79), loosen the four latch plate screws (Figure 80), and move the latch plate.

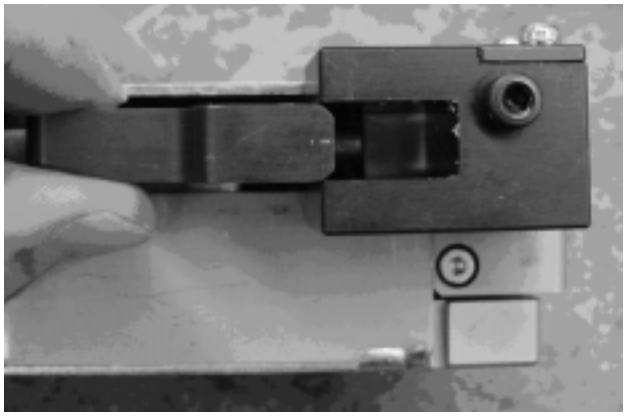


Figure 79

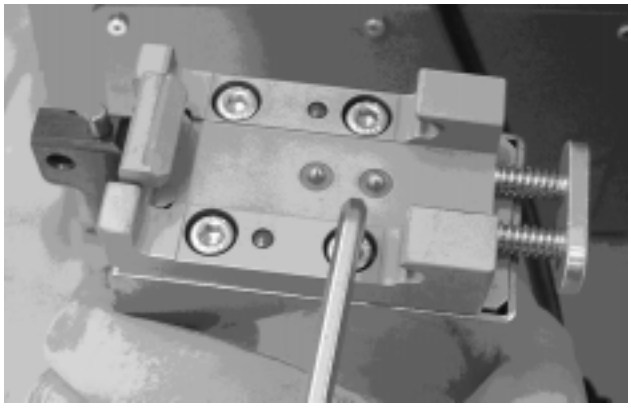


Figure 80

8. Install the quick–release pin through gage block and feed arm.

9. If the quick–release pin does not pass completely through the feed arm, loosen feed arm screws (Figure 81), and move feed arm.

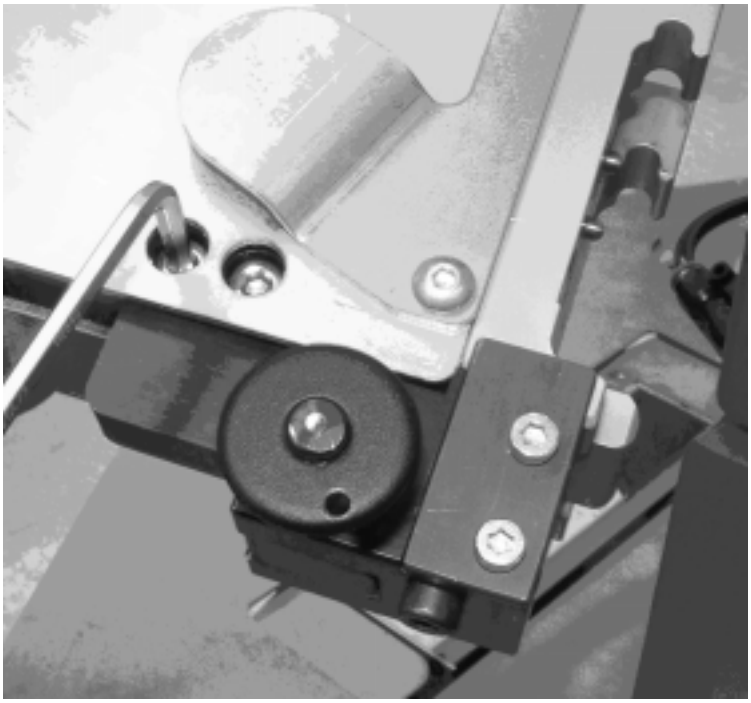


Figure 81

10. Retighten all the loose hardware.
11. Select the “Apply” icon to set the gage position (Figure 82).

Figure 82

12. Remove the pin and gage block, then select the “Power” icon (Figure 83) to restore power.

Figure 83

5.3. System III Applicator Data

Applicator Data Operations:

Each System III applicator comes equipped with a data storage device (Figure 84). This device allows the storage of key operating parameters that allow easy setup between terminals and also contains reference data that can be useful for other machine setups and crimp inspection. In the following section we will review the details of its operation.

The System III Applicator works in conjunction with the AMPOMATOR System III leadmaker to form a complete system that allows for easy setup and operation. The following is a complete list of data that is available on the storage device. This data is listed in three separate groups: Applicator Data; Terminal Data; and Maintenance Data. A significant amount of the data is reference data to aid in the setup of the machine and inspection of the final crimp. In the future, as machines evolve that use the System III Applicator, more of this data will be directly used by the machine control in order to simplify programming and setup.

Figure 84

Applicator Data:

- Applicator Part Number: The part number assigned by Tyco Electronics.
- Applicator Name: Customer assigned name.
- Applicator Serial Number: The serial number of the applicator assigned by Tyco Electronics. The serial number is unique for each applicator manufactured by Tyco Electronics.
- Applicator Type: Identifies type of applicator for proper machine setup. This includes reference data only.
- Full Cycle or Split Cycle: Identifies the cycle requirement of the applicator for proper machine setup. This includes reference data only.
- Split Cycle Position: If it is a Split Cycle Applicator, this is the distance from bottom of stroke for the setting of the machine. This includes reference data only.
- Minimum Strip Length of Wire: The terminal manufacture's recommended minimum wire strip length. This includes reference data only.
- Maximum Strip Length of Wire: The terminal manufacture's recommended maximum wire strip length. This includes reference data only.
- Length of Terminal: The maximum length of terminal that can be run in the applicator. This includes reference data only.
- Anvil Height: Reference dimension used to calculate crimp height adjustment on the System III Servo Terminator.
- Crimper Length: Reference dimension used to calculate crimp height adjustment on the System III Servo Terminator.
- Tooling Clear Position: Reference dimension used by the System III Servo Terminator.
- Tooling Crash Limit: Reference dimension used to protect the applicator tooling on the System III Servo Terminator. Even with this data , it is possible to damage tooling due to other setup errors.
- Vertical Height: The vertical height, or wire line, setup parameter used by the System III Servo Terminator. This value is initially calculated but is easily changed and automatically saved when you adjust the vertical height of the terminator.
- General Note Field: Customer note field (edited utilizing the pc utility for applicator maintenance).

Terminal Data (48 total possible terminals in one applicator)

- Terminal Part Number: The manufacturers terminal part number.
- Feed Finger Extend Position: The feed finger extend position that places the terminal in the crimp tooling. This value is initially calculated but is easily changed and automatically saved when you adjust the feed extend position.
- Product Feed Pitch: The product feed pitch is the spacing between terminals. Simply described, it is the retract position of the feed finger. This value is initially calculated but is easily changed and automatically saved when you adjust the feed retract position.
- Feed Finger Speed/Motion Profile: The manufacture's set speed or motion profile for proper terminal feeding.

- Terminator Crimp Speed: The manufacturers set terminator crimp speed. Some terminals may need to be crimped at a speed which is slower than a normal terminator crimping speed. This includes reference data only.
- Application Specification: This is the terminal manufacturer's Application Specification number useful for crimp inspection. This includes reference data only.
- Map Table Data: This table allows the customer to provide an alternate terminal name for any terminal part number that exists in the applicator.

  Alternate Terminal Name: Terminals can have more than one alternate terminal name. Note: A possible 50 alternate names are allocated in the storage device.

- Wire Crimp Height Record: Provides the wire size, crimp height, and tolerance specifications recommend by the terminal manufacturer. A possible total of 5 records are available on the storage device to accommodate terminals that have different specifications.

  Wire Size (mm2 or AWG): Specifies the wire size.

  Target Crimp Height: Specifies the manufacturers crimp height for the wire.

  +/– Crimp Height Tolerance: Specifies the manufacturers crimp height tolerance for the crimp.
- Run Table: For use on a System III Servo Terminator. This data is saved for future setups.

  Terminal Part Number Run: The part number of the terminal that was run.

  Crimp Height Run: The crimp height that was run with that terminal. This can be a "Custom" crimp height that is customer specified.

  Crimp Adjust Value: The adjustment parameter used by the Tyco Electronics System III Servo Terminator to achieve the crimp height.

Applicator Maintenance Data:

The System III Applicator supports functionality similar to the Tyco Electronics EDGE applicator counter. A separate pc utility is used to manage the maintenance of the System III Applicator. If selected, the machine can be configured to stop when a "target" has been reached.

- Applicator Maintenance Target: The number of cycles assigned before the applicator requires service. Similar to a car's oil change interval. This target is customer assigned.
- Applicator Reset Count: The number of cycles that were on the applicator when service was last performed.
- Total Applicator Cycle Count: The total number of cycles that are on the applicator.
- Applicator Service Data: The date when service was last performed.
- Applicator Date of Manufacture
- Account Number: The Tyco Electronics account number for the customer.
- Account Data: 128 characters that the customer can use for account address, facility information, etc.
- Tool Name: A total of 10 tools are permitted. The manufacturer's recommended spare parts will be pre–programmed into the storage device.
- Tool Part Number: The manufacturer's part number of the tool.
- Tool Service Target: Customer entered number of cycles for a service warning.
- Tool Reset Count: The number of cycles that were on the applicator when service was last performed on this specific tool.
- Tool Service Date: The date when service was last performed on this specific tool.

The data contained on the applicator can be accessed in two ways:

A. Accessing the Applicator Data –– Method One

1. Select the "ST" icon from the TopWin main menu bar. See Figure 85.

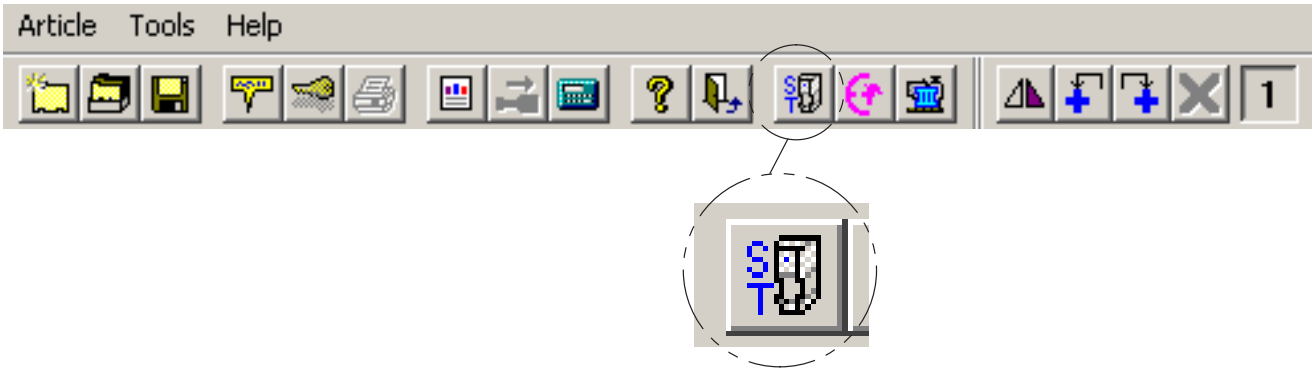


Figure 85

2. Select the appropriate station (S1 or S2).
3. Select the applicator icon. See Figure 86.

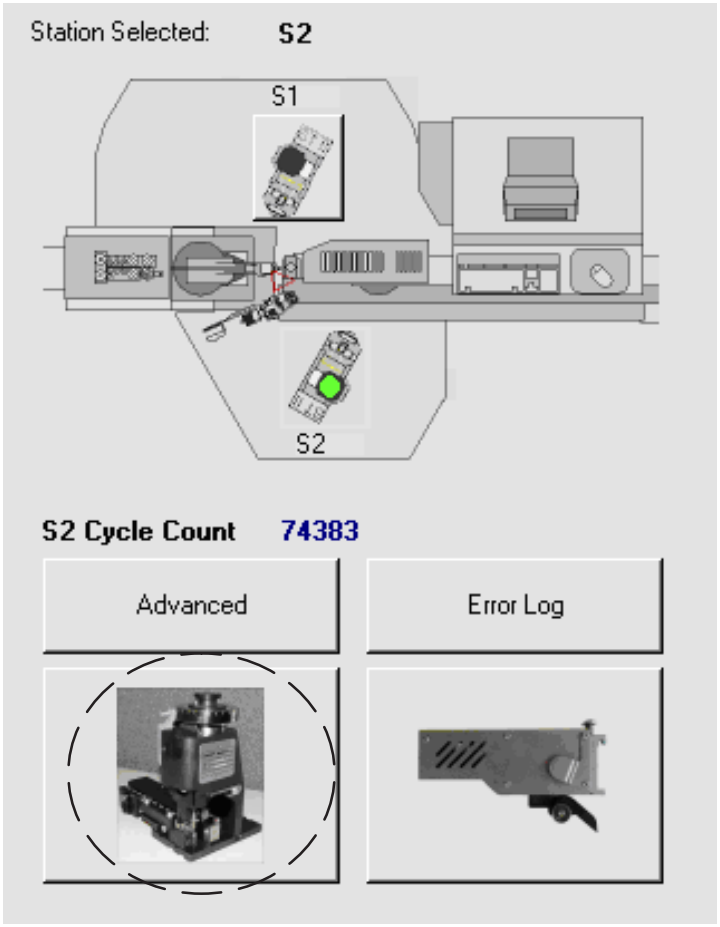


Figure 86

4. The data will display (Figure 87).

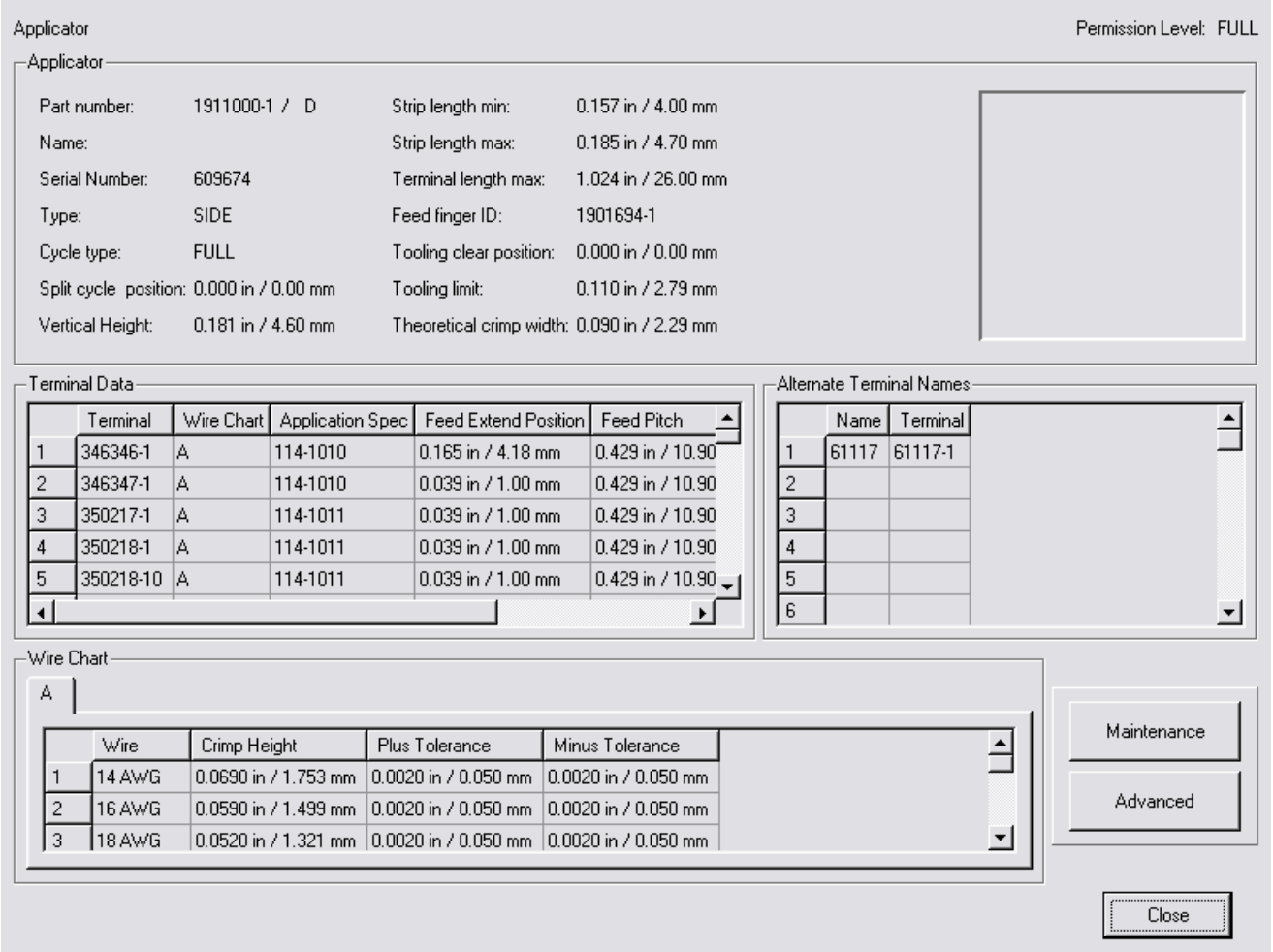


Figure 87

B. Accessing the Applicator Data –– Method Two

1. Select the terminal from the screen in Figure 88.
2. Select the terminator icon on the process tab. See Figure 89.
3. A general overview of the applicator is contained in Figure 90.
4. Access the the data, by selecting the applicator icon shown in Figure 90.

NOTE

A terminal must be created before accessing the data in this manor.

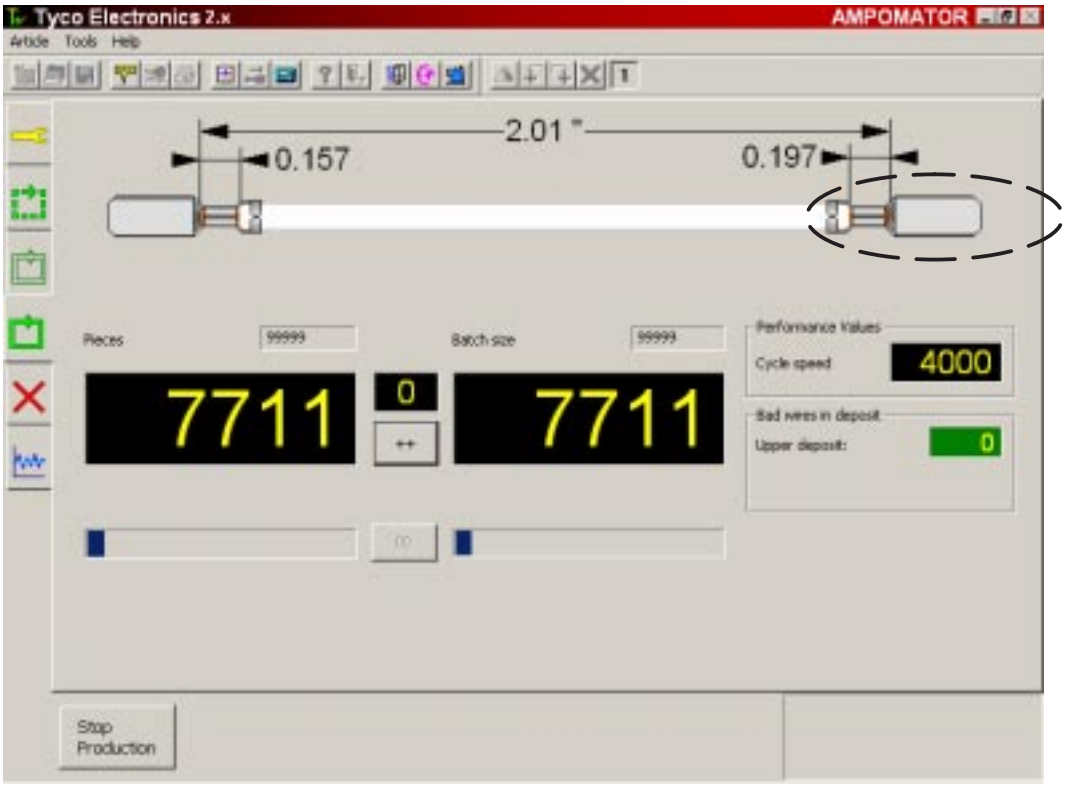


Figure 88

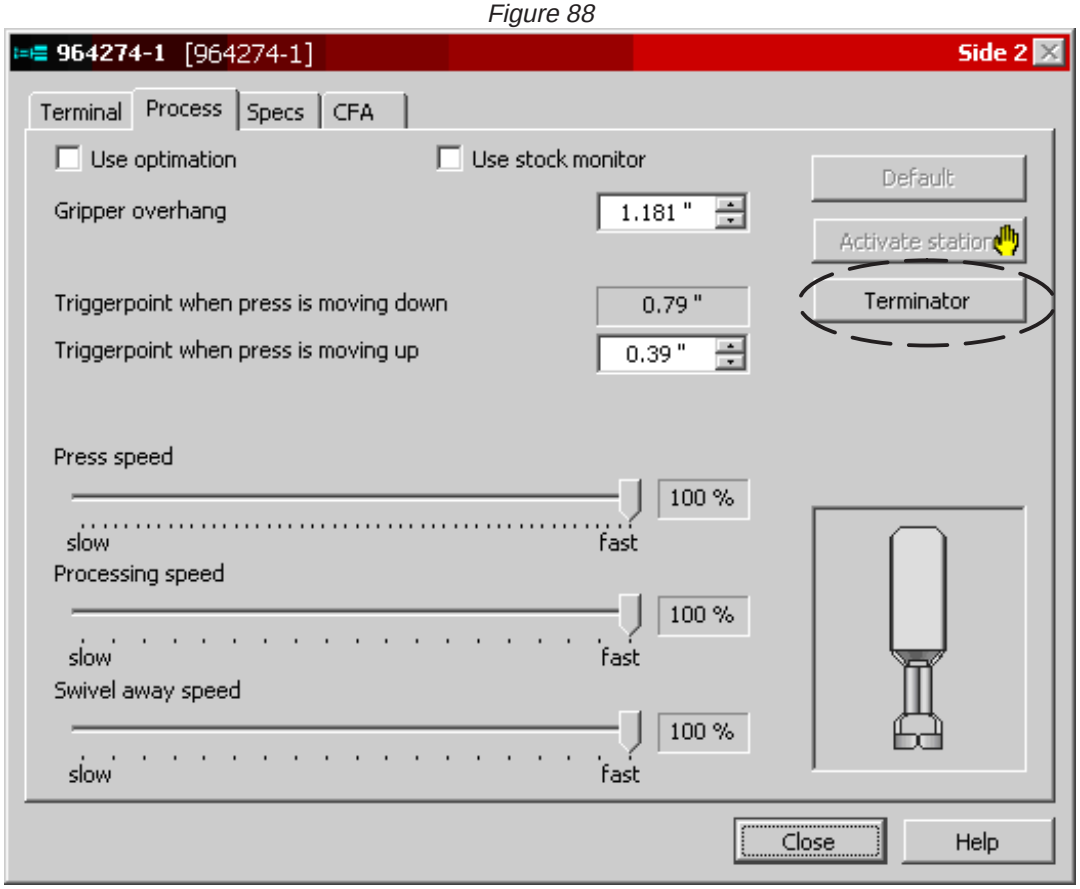


Figure 89

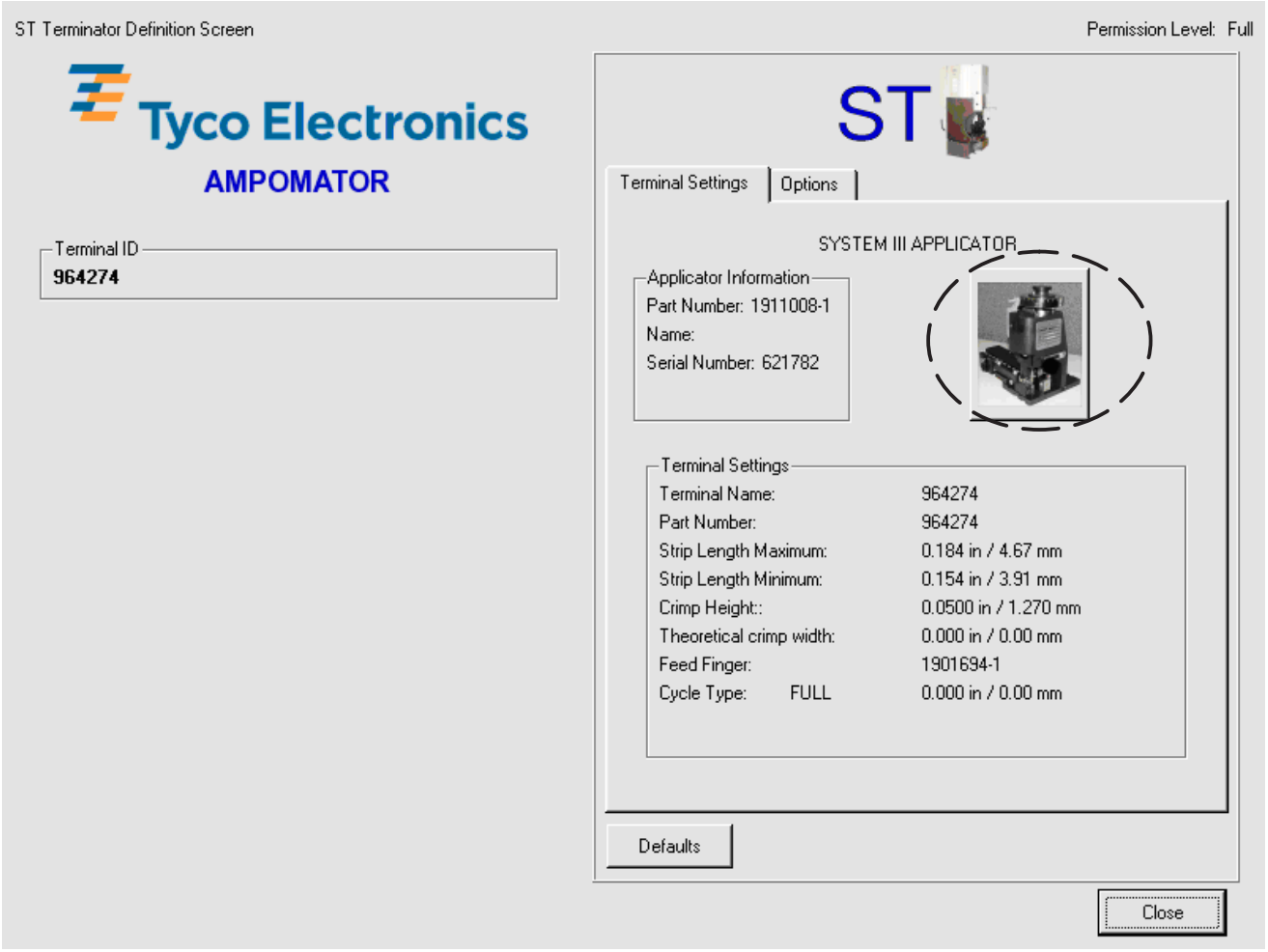


Figure 90

5.4. System III Feeder Production Setup

Access to the information contained in Figure 87 is important prior to setting up a System III applicator for production since each applicator comes pre–loaded with terminal part number, wire data and crimp height data.

The process of setting up a terminal follows the standard setup procedure except for several differences.

First, the terminal ID (in Figure 91) should match the Terminal Data ID contained in Figure 87.

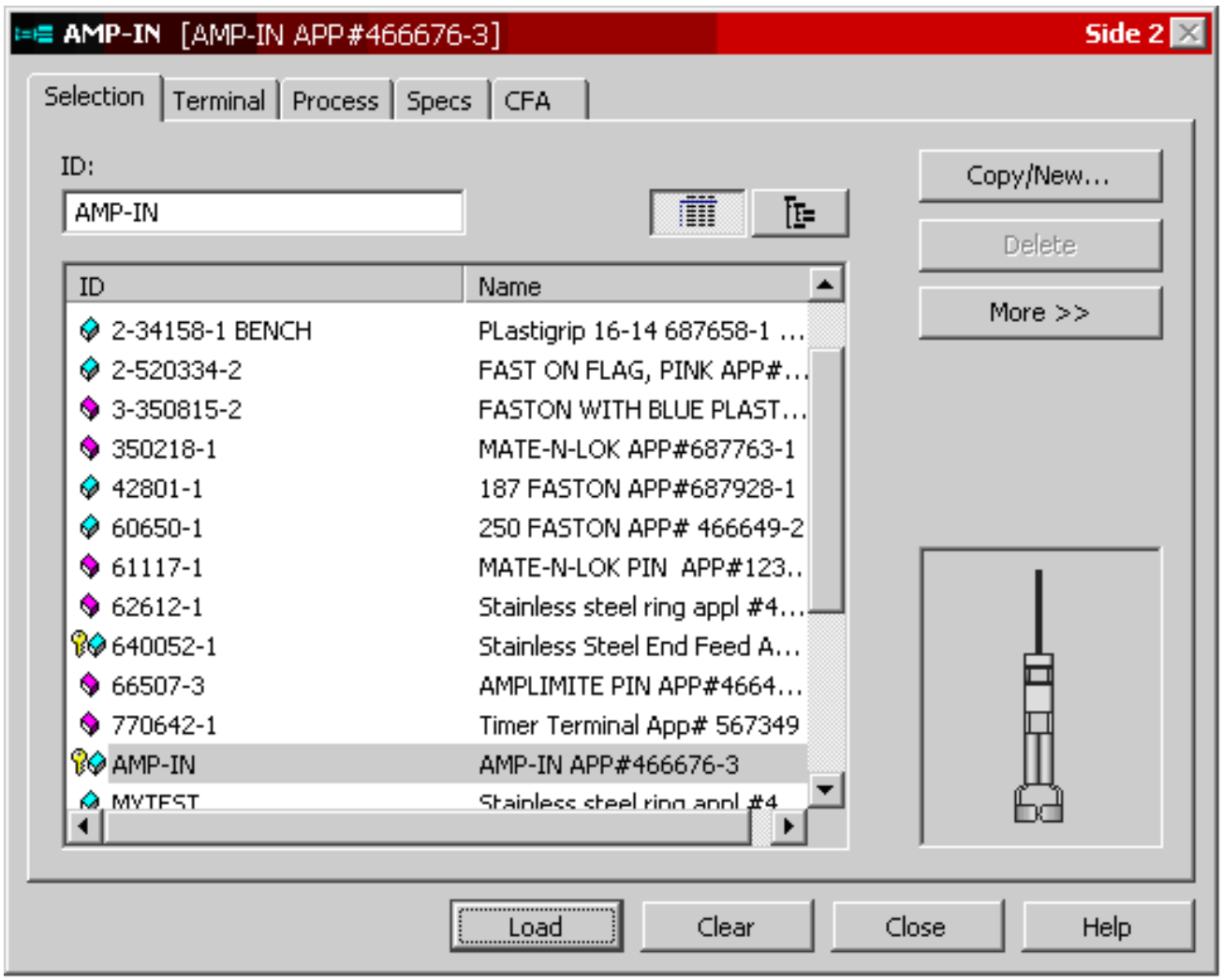
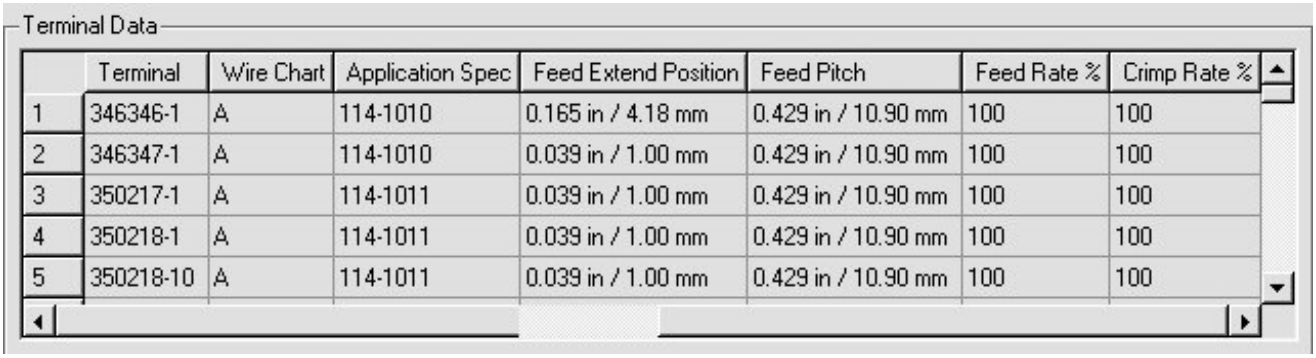


Figure 91

Figure 92 shows a portion of the terminal data table from Figure 87 with the available preloaded terminal IDs.



	Terminal	Wire Chart	Application Spec	Feed Extend Position	Feed Pitch	Feed Rate %	Crimp Rate %
1	346346-1	A	114-1010	0.165 in / 4.18 mm	0.429 in / 10.90 mm	100	100
2	346347-1	A	114-1010	0.039 in / 1.00 mm	0.429 in / 10.90 mm	100	100
3	350217-1	A	114-1011	0.039 in / 1.00 mm	0.429 in / 10.90 mm	100	100
4	350218-1	A	114-1011	0.039 in / 1.00 mm	0.429 in / 10.90 mm	100	100
5	350218-10	A	114-1011	0.039 in / 1.00 mm	0.429 in / 10.90 mm	100	100

Figure 92

Second, the crimp height under the “Specs” tab, (Figure 93) must match the data contained in Figure 87 for a given wire size.

The Spec MUST be entered manually

The System III Applicator does allow alternate terminal names and custom crimp heights.

Use a different terminal ID and crimp height specification.

Access the terminator specific information from the “Process” tab (Figure 94).

If the terminal ID differs from what is loaded in the applicator you will be prompted to map the new ID to an existing ID. Refer to Figure 95.

If the crimp height entered under the “Specs” tab (Figure 93) differs from what is loaded in the applicator, you will be prompted to add the new crimp height to the applicator.

CAUTION

The data loaded in the applicator must match the data from the terminal specification. If there is a difference verify the values prior to saving them to the applicator. Terminals can be run at the wrong crimp height if a value is added to applicator data..

NOTE

The System III Applicator can not be run unless the terminal name and crimp height specified in TopWin matches what is loaded in the applicator data storage. Once you have provided an alternate terminal name or a custom crimp height, this information will be stored on the applicator data storage device for future use.

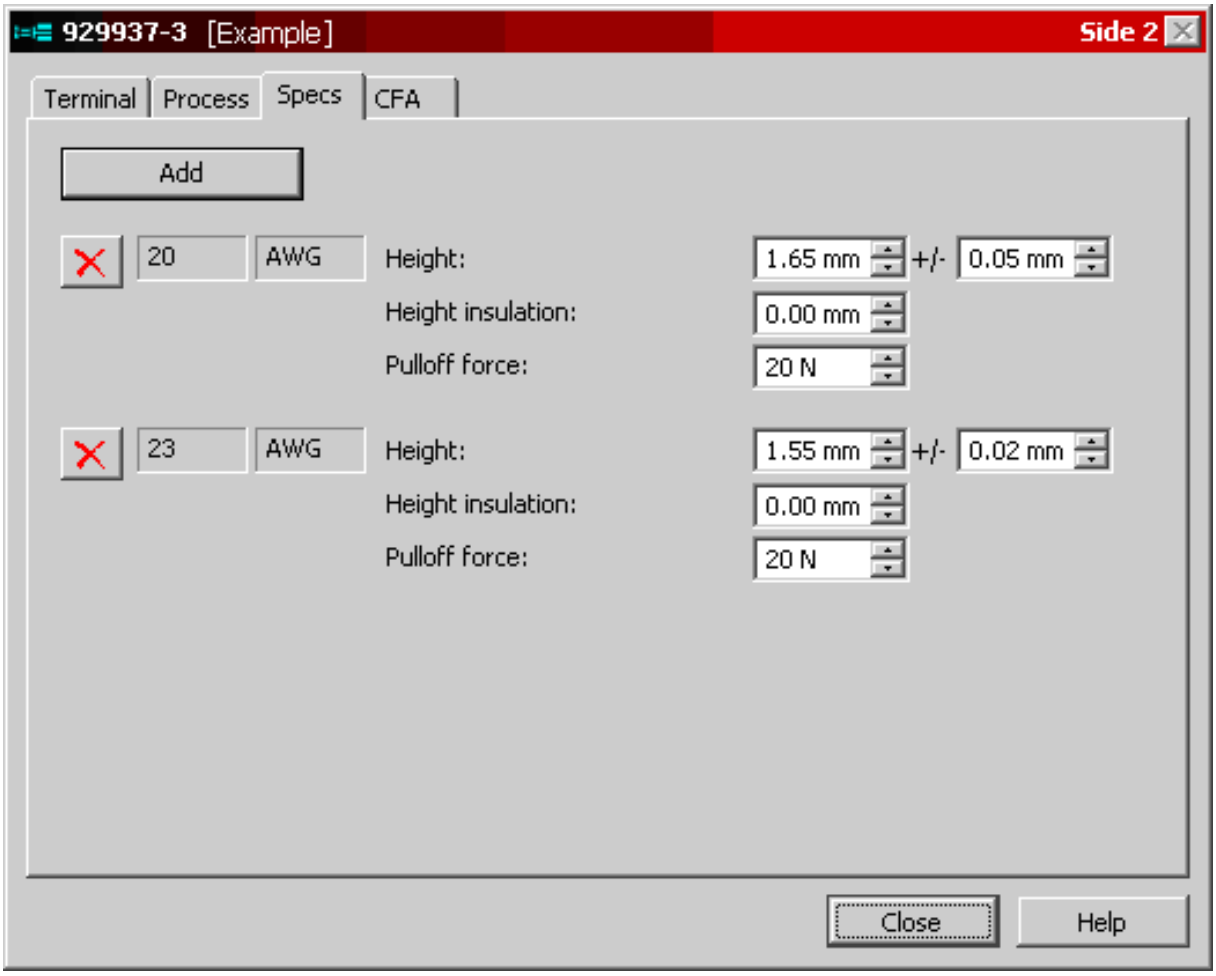


Figure 93

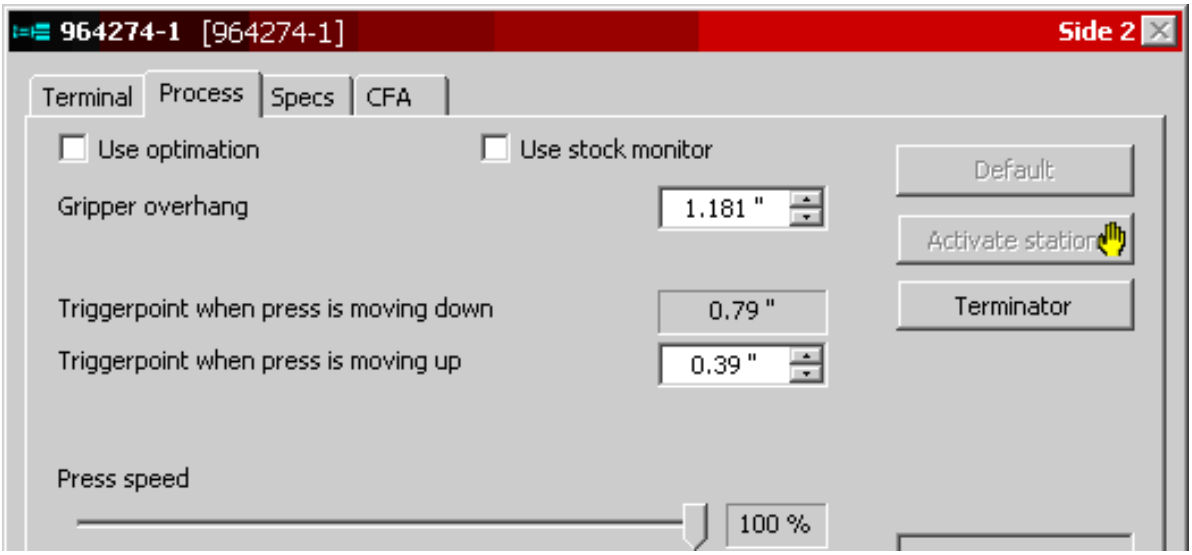


Figure 94

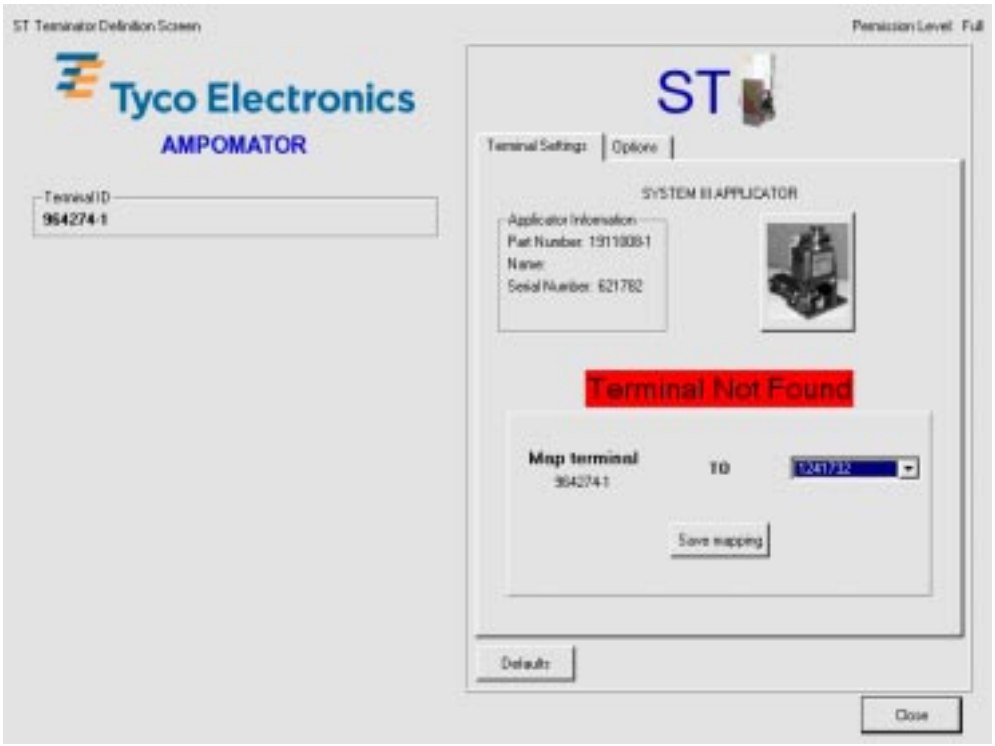


Figure 95

6. MAINTENANCE

6.1. Clearing A Jammed Terminator

In very rare cases, a terminator may become jammed and not be able to complete a cycle. This may happen, for instance, if multiple terminals are present in the crimp area. If this happens, attempt to clear the jam by backing the ram up (with the jog button on the terminator keypad.) If this is not successful, a wrench can be used on the crimp adjust shaft to relieve pressure. (Refer to Figure 96.) First, remove the front cover. Place a wrench on the 32 mm hex at the top of the terminator ram. See picture below. Turn the adjust screw approximately one full turn counter–clockwise as shown with the arrow. Remove the wrench and attempt to jog the ram up again.

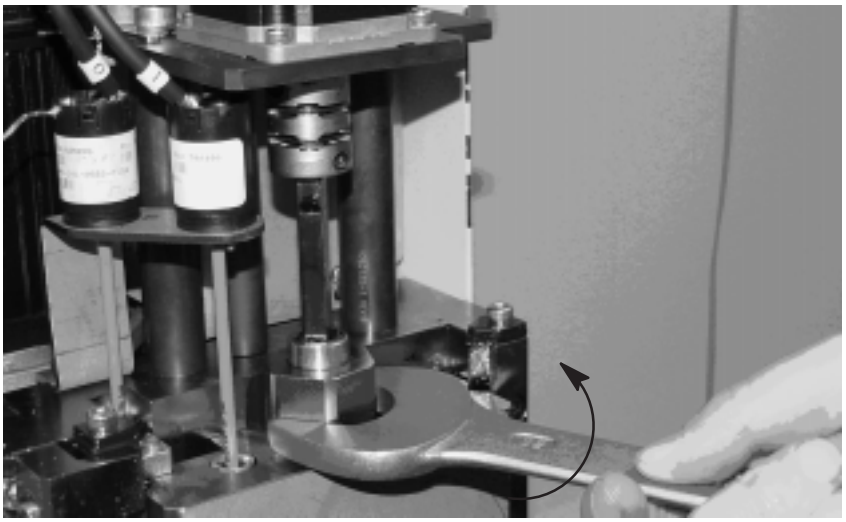


Figure 96

6.2. Terminator Ram Bearing Adjustment

The bearings used to guide the ram of the terminator may require adjustment if the screws used to hold the bearing races are loosened or if excess clearance in the ram bearings is felt. When the terminator is cycled under power, the bearings “seat in,” and a small amount of play develops. It is important to adjust this play out of the ram to ensure consistent crimp results. Minor amounts of clearance are acceptable, but if the amount of clearance increases the bearing races should be adjusted.

CAUTION

Proper bearing preload is critical to prevent premature bearing failure.

A. Checking for Bearing Play

To check for ram linear bearing play, try to move the ram left and right. Minor amounts of play are acceptable. The ram will have significant amount of play in the up and down direction due to system clearances. If too much left to right play is suspected, adjusting the bearing clearances is recommended.

DANGER

To avoid personal injury, be sure the machine is turned off and power to the machine is disconnected before adjusting.

B. Adjusting the Bearing Clearance (Figure 97)

1. Remove applicator.
2. Verify right side bearing race and left side bearing retainer are pushed up against their alignment edges.
3. Loosen the jam nuts used to hold the spring plungers in place. The jam nuts are located on the bearing retainer (Figure 97).
4. Loosen the spring–loaded plungers until they no longer exert pressure on the left side bearing race.
5. Loosen the three screws used to hold the bearing in position.
6. When the bearings are free to move, turn all three spring–loaded plungers clockwise until the threaded body bottoms out on the bearing race.

7. Back the plunger body off the bearings by a quarter turn. The spring–loaded plunger will still be exerting the correct preload force.

8. Tighten the three screws used to hold the bearing race in position.

9. Turn the three plungers clockwise until they bottom on the bearing race.

10. Tighten the three jam nuts.

11. Check for bearing play, as described above.

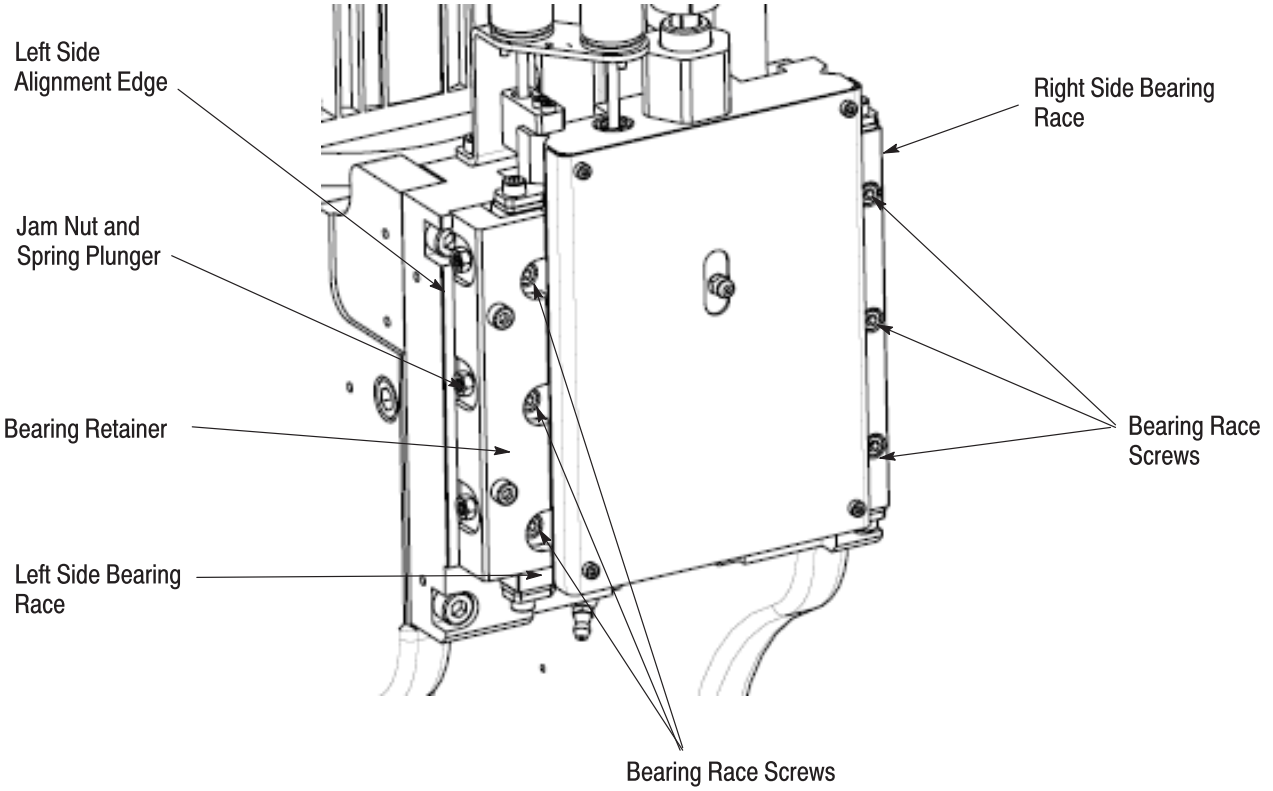


Figure 97

6.3. Replacing the Terminator Ram Assembly

To perform the ram assembly replacement, refer to drawing 1752160 and proceed as follows:

1. Using a 3 mm hex wrench, remove the front cover.

2. Using a 2.5mm hex wrench, remove the ram cover.

3. Using a 5 mm hex wrench, remove the tonk bracket.

4. Using a 4 mm hex wrench, remove the ram adapter assembly and swing it out of the way.

5. Using a 4 mm hex wrench, remove the bracket that holds both displacement sensors and swing it out of the way.

6. Using a 2.5 mm hex wrench, loosen the lower clamping screw on the flexible coupling. Then slide the square crimp height adjusting shaft down out of the coupler into the ram assembly.

7. Using a 4 mm hex wrench, remove the rail retainer.

8. Using a 4 mm hex wrench, remove the 6 special crossed roller rail guide screws and set aside for later use.

9. Pull the ram assembly off the crankshaft.

10. Inspect and replace the crossed roller bearings as necessary.

11. To assemble the ram, reverse the disassembly procedure.

12. Follow the instructions Drawing No. 1752160 to set the proper bearing clearance.

13. Follow the instructions in 408–10093 to align the ram adapter to the base–plate (with Alignment Gage 1901545–1) as well as set the terminator shut height. See 408–10095 for setting the shut height.

6.4. Replacing the Terminator Drive Motor (Figure 98)

Refer to Figure 98, as well as Drawing No. 1752160 and proceed as follows:

1. Refer to the electrical panel replacement section and remove the electrical panel.

2. Using a 5 mm hex wrench, remove the four mounting screws.

3. Pull the motor out of the gearbox. Make sure to remove the shaft key if it stays in the gearbox.

4. Be sure the new motor key is oriented as shown on servo motor assembly Drawing No. 1752281 prior to installing the motor into the gearbox. If installing the key on the motor shaft, be careful not to exert a side load on the motor bearings.

5. Apply a small amount of grease to the motor shaft prior to engaging it with the gearbox. Use the grease specified in the terminator maintenance section.

6. To re–assemble, perform the reverse order of disassembly.

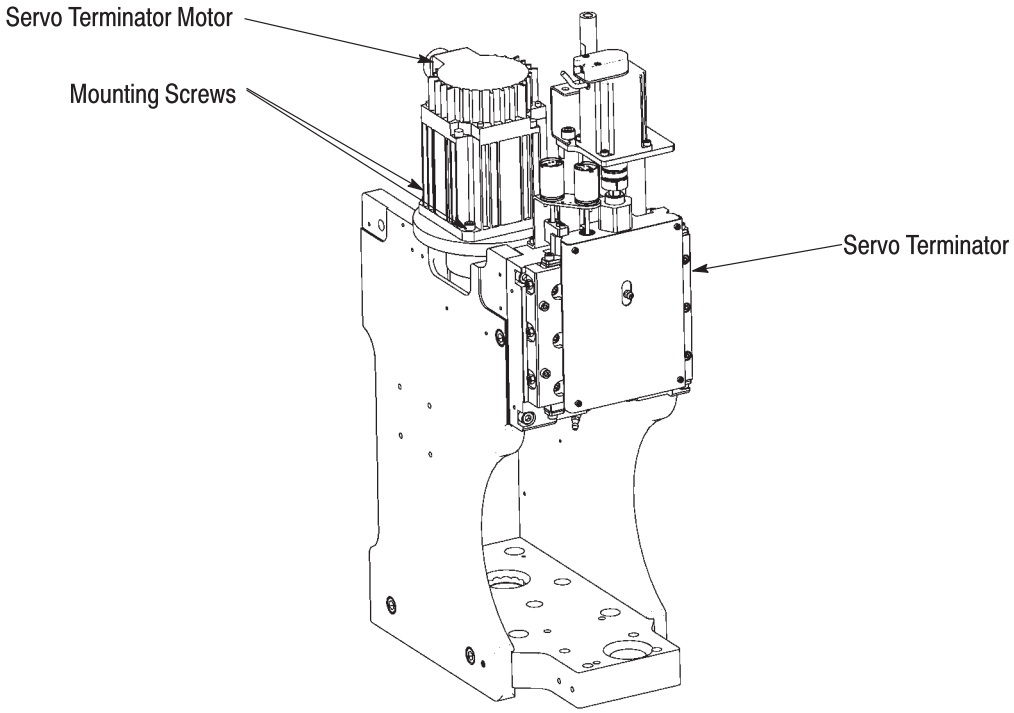


Figure 98

6.5. Replacing the Crimp Height Motor

Refer to assembly drawing 1752160 and do the following to replace the crimp height motor:

1. Using a 3 mm hex wrench, remove the top and front covers.

2. Using a 2.5 mm hex wrench, loosen the upper clamping screw on the flexible coupling.

3. Unplug the motor and encoder cables.
4. Using a 3 mm hex wrench, remove the motor mounting screws.
5. When removing the motor, ***be sure*** to hold the flexible coupling so it is not stretched.
6. Set the new motor in place on the mounting bracket and engage it in the flexible coupling. Loosely install the mounting screws.
7. Using a 2.5 mm hex wrench, tighten the upper clamping screw on the flexible coupling.
8. With the ram at top dead center, allow the motor to float into axial alignment with the flexible coupling and square shaft.
9. Using a 3 mm hex wrench, tighten the motor mounting screws.
10. Reconnect the motor and encoder cables.
11. Using a 3 mm hex wrench, install the top and front covers.

6.6. Replacing the Terminator Height Motor

A. Vertical Height Adjustment Motor Replacement

To replace the vertical height adjustment motor:

1. First remove the terminator unit from the leadmaker.
2. Next, use eye bolt 1752476–1 to lay the terminator on its side.
3. To gain access to the motor, remove the access panel from the vertical height adjustment base (see Figure 99).

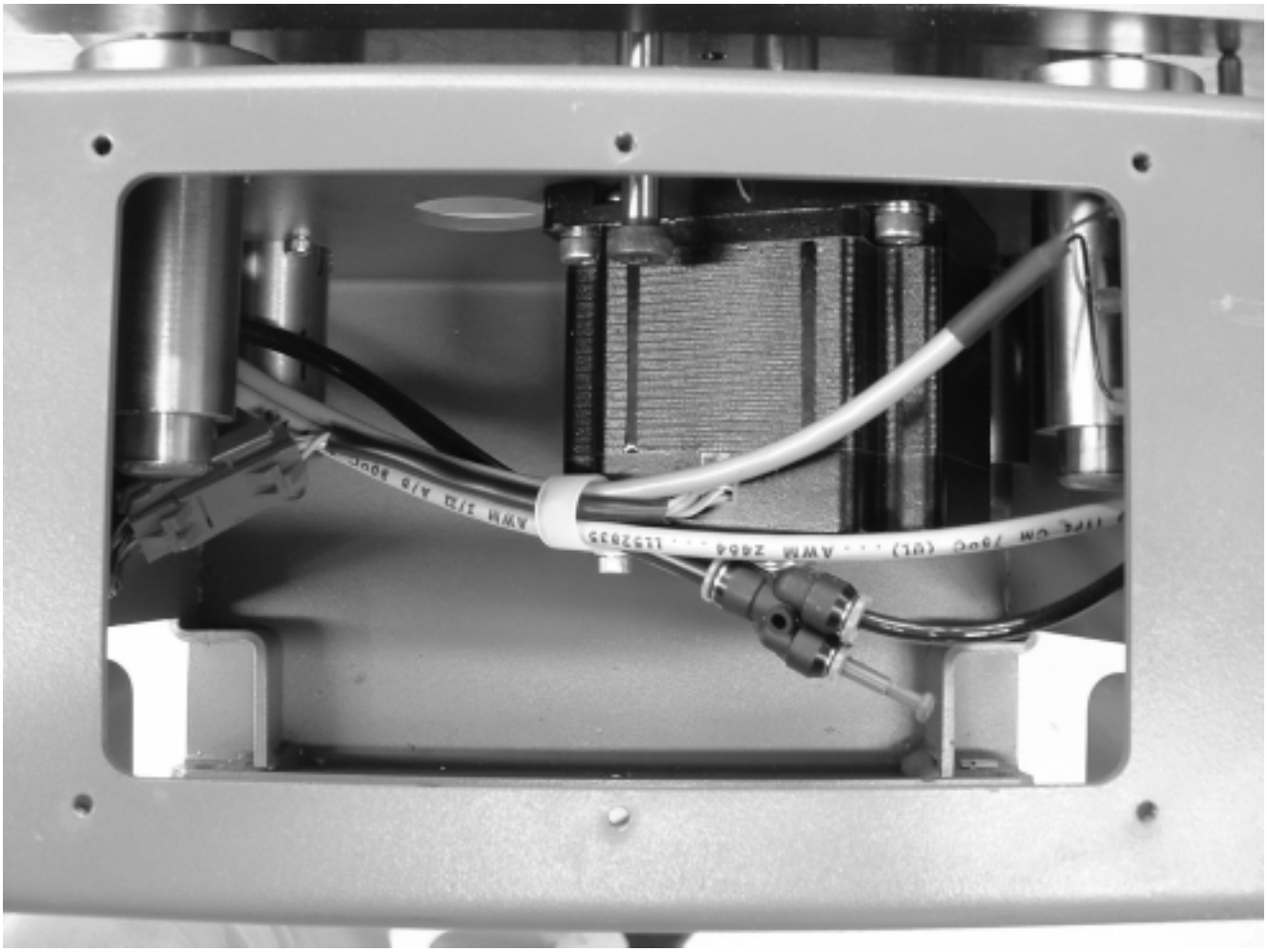


Figure 99

4. Remove the “P–Clip” securing the wires and pneumatic tubing. In addition, disconnect the motor wire at the connector. See Figure 100.

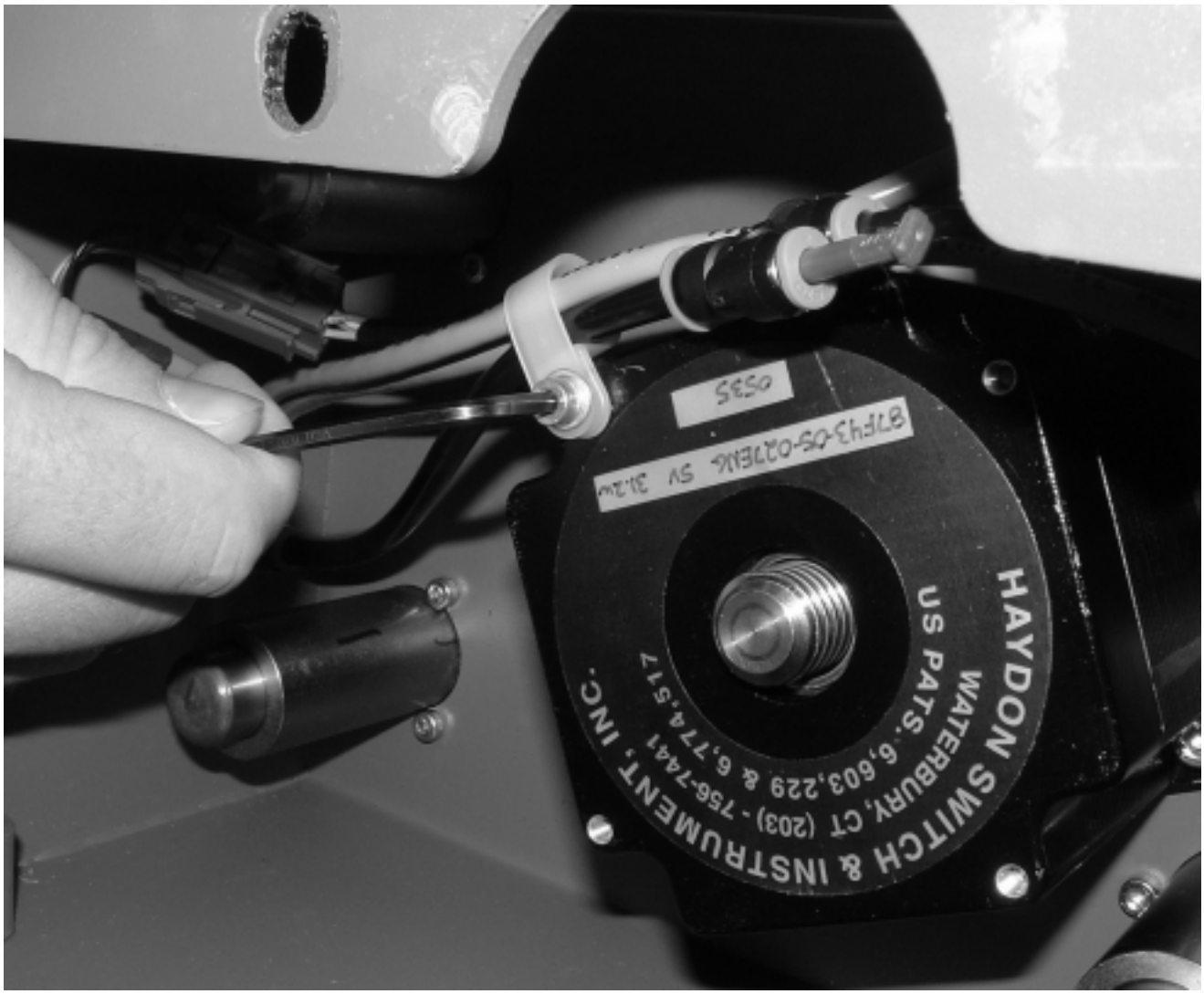


Figure 100

5. Remove the two shoulder bolts used to prevent the terminator from coming off the base by accident. See Figure 101.

Figure 101

6. Remove the four socket head cap screws used to hold the motor in place. See Figure 102.

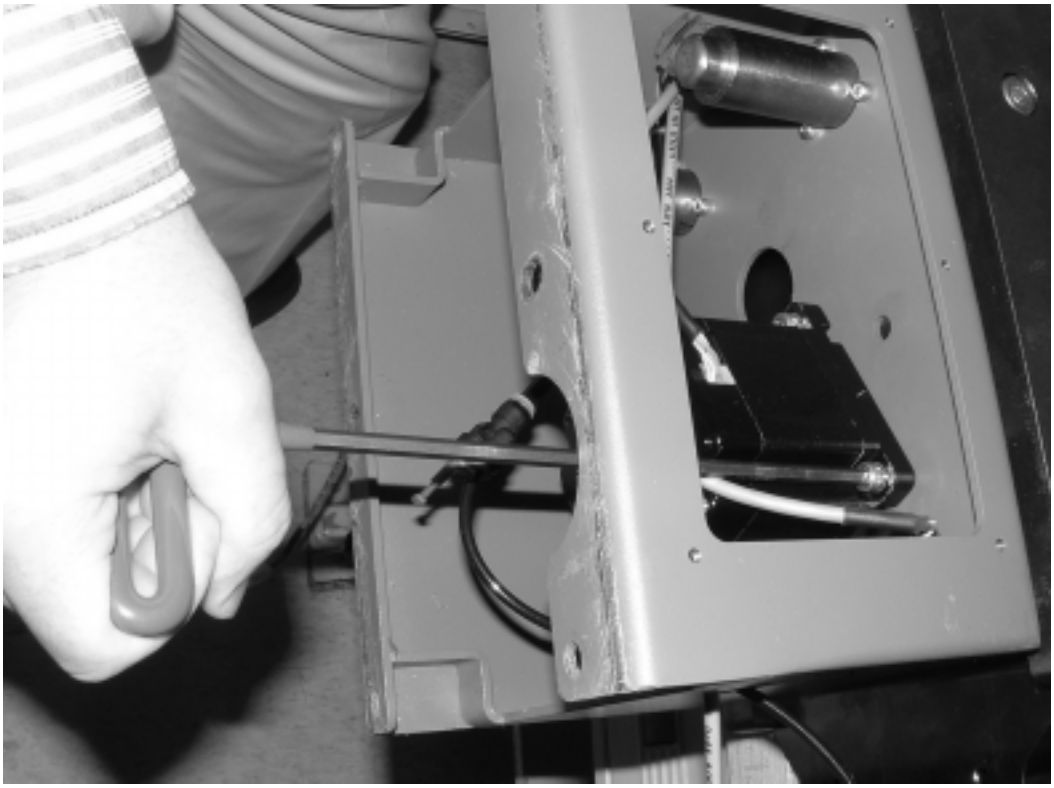


Figure 102

7. With the cap screws removed unscrew the motor from the actuating screw by spinning it in a counterclockwise direction. See Figure 103.

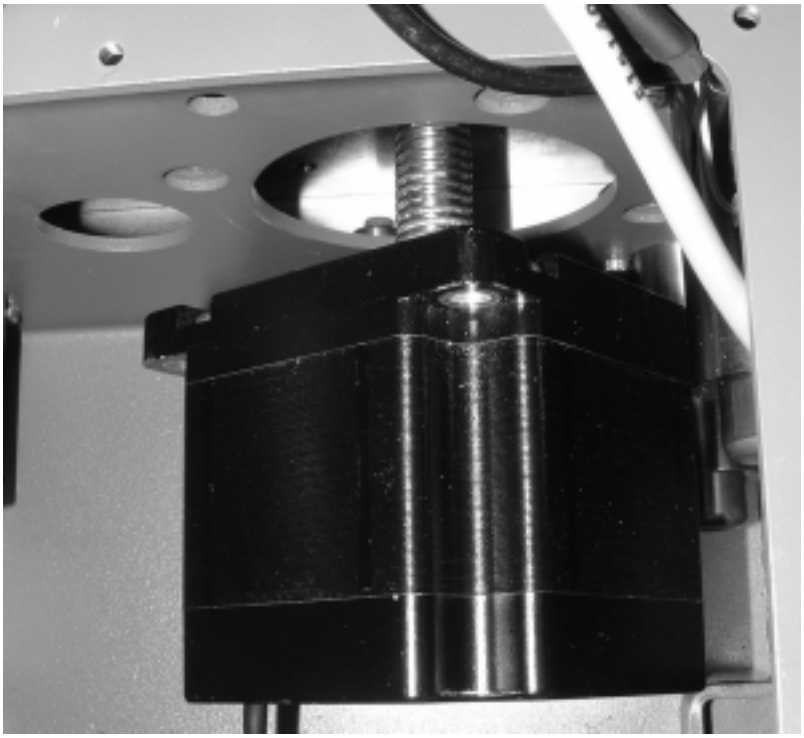


Figure 103

8. If the lead screw requires replacement use the provided wrench flats to remove the screw from the base of the terminator as shown in Figure 104.

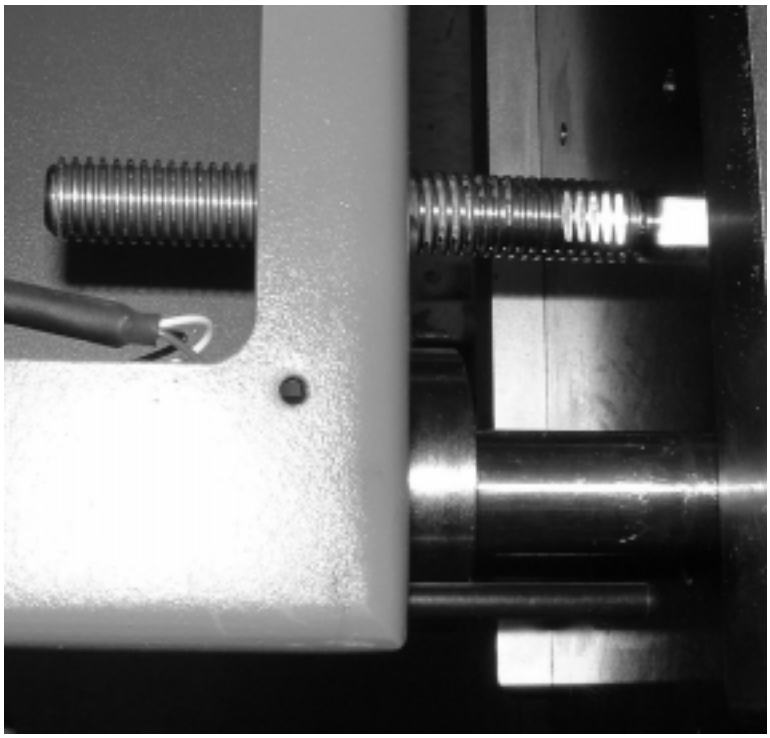


Figure 104

9. To install the motor, reverse the order of removal.

CAUTION

The lead screw and motor are lubricated at the factory and should require no further lubrication.

B. Vertical Height Position Sensor Replacement

To gain access to the vertical height position sensor, proceed as follows.

1. Remove the access panel from the vertical height adjustment base as shown in Figure 105.

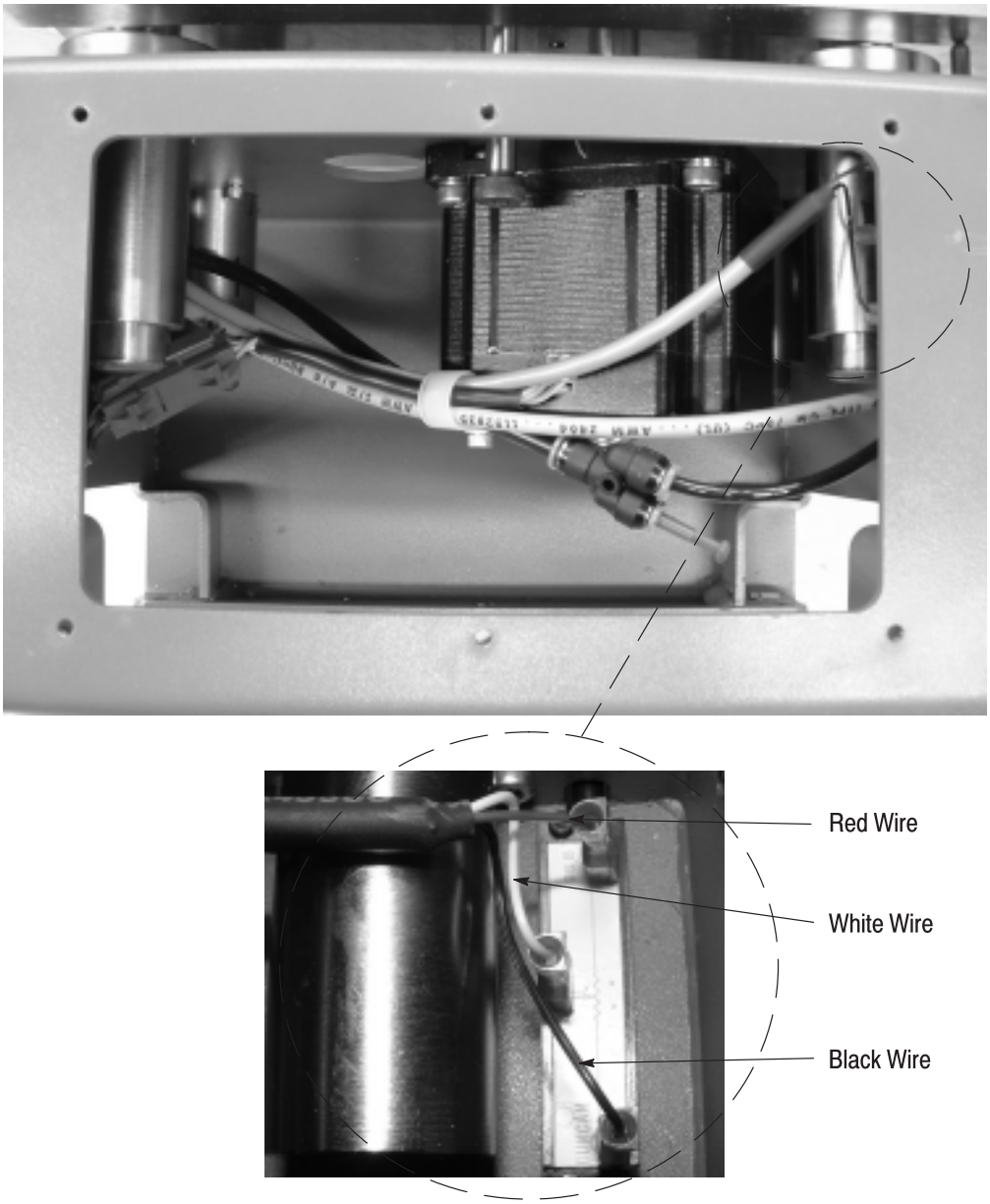


Figure 105

2. Disconnect the wires in Figure 105, noting the order of the red, white and black wires.

3. Remove bottom screw and loosen the top screw. The sensor will now slide out of position. Refer to Figure 106.

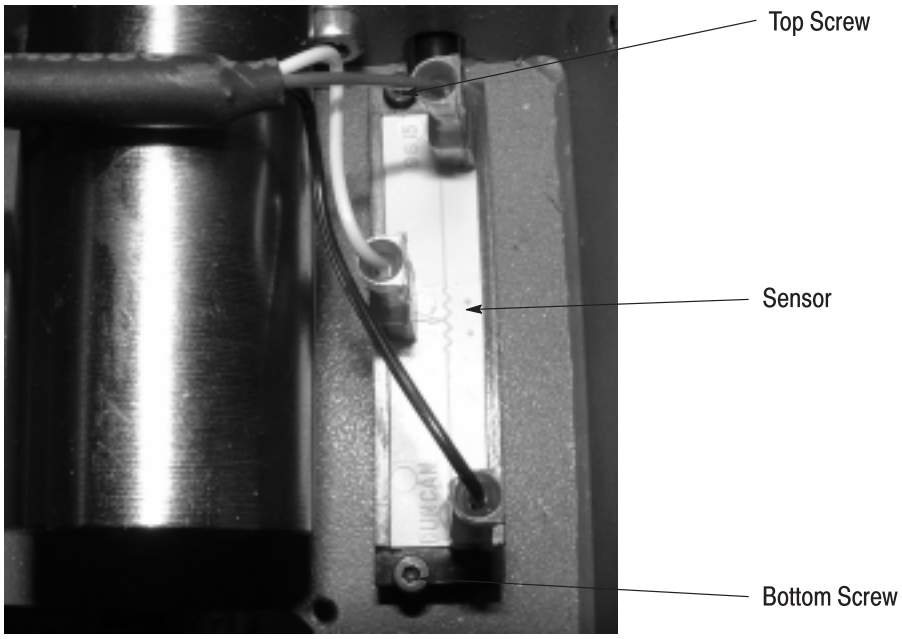


Figure 106

4. To re–install the sensor, reverse the order of disassembly.

CAUTION

Do NOT overtighten the screws used to hold the sensor in place.

6.7. Replacing the Terminator Displacement Sensor

To replace a displacement sensor, refer to Figure 107 and perform the following.

1. Using a 3 mm hex wrench, remove the front cover.

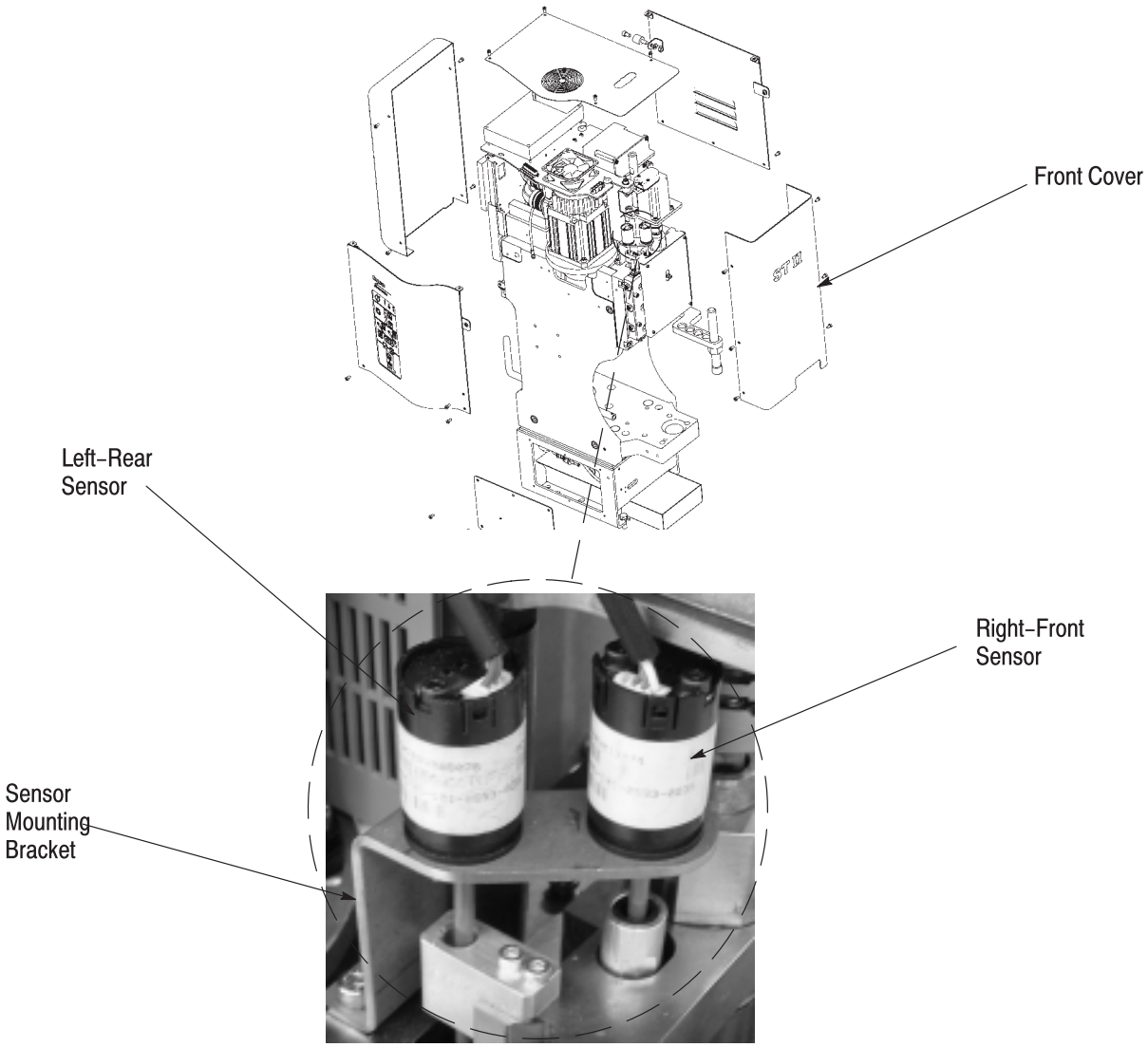


Figure 107

2. Replace either or both displacement sensors.

NOTE

The right–front sensor detects the inner ram position. The left–rear sensor detects the outer ram position.

a. Unplug the sensor cables and note their position.
b. Using a 4 mm hex wrench, remove the sensor bracket.
c. Using a 2.5 mm hex wrench, remove the sensor from the mounting bracket.
d. Assemble in reverse order.

NOTE

Do not over tighten the sensor mounting screws.

NOTE

Position the sensor bracket to minimize scuffing of the sensor probes on the guide tubes.

6.8. Replacing the Terminator Force Sensor and Cable

NOTE

References to the "crimp quality monitor" refer to the SLE Crimp Quality Monitor.

SLE Crimp Quality Monitor–Style Ram Adapter

1. Loosen and remove the cover over the crimp quality monitor assembly.
2. Unscrew and remove the sensor cable from the crimp quality monitor assembly.
3. Using a 3 mm hex wrench, remove the force sensor cable relief mount from the servo terminator side plate.
4. Using a 4 mm hex wrench, remove the ram adapter assembly from the servo terminator ram.
5. Using a 3 mm hex wrench, remove the sensor cable relief cap from the sensor cable relief mount.
6. Using a 5 mm hex wrench, remove the screw that holds the ring force sensor in place and connects the ram base adapter to the ram adapter.
7. Loosen the ram base adapter enough that the force sensor is free to move. It is not necessary to totally separate the ram base adapter from the ram adapter.
8. Push the cable into the assembly until the force sensor slides out the front of the assembly.
9. Remove the heatshrink tubing from the cable connection.
10. Using pliers, gently grip the knurled connection collar and unscrew the sensor from the cable connector.
11. Pull the cable out of the assembly.
12. Thread a new cable through the assembly until it extends from the front of the assembly.
13. Slide a new section of heatshrink tubing over the end of the cable.
14. Apply a small amount of "threadlock" to the new sensor threads.
15. Using pliers, gently grip the knurled connection collar and screw the sensor into the cable connector until fully seated.
16. Position the heatshrink tubing over the connection and fully shrink it.
17. Gently push the sensor and pull the cable to position the sensor in the assembly.
18. Apply "threadlock" to the ram base adapter screw and tighten it (as specified in the applicable assembly drawing).

NOTE

To set the proper sensor pre–load without a torque wrench, refer to 409–10076.

19. Reinstall the sensor cable relief cap on the sensor relief mount.
20. Allow the "threadlock" to fully cure, as specified by the manufacturer.

21. Loosely install the ram adapter assembly to the servo terminator ram.

22. Install the force sensor cable relief mount to the servo terminator side plate.

23. Connect the force sensor cable to the crimp quality monitor assembly.

24. Re–install the monitor cover.

25. Refer to IS 408–10093 (*Using Alignment Gage 1901545–1)* and align the baseplate to the ram adapter. Tighten the mounting screws.

26. Refer to 408–10095 (*Using Shut–Height Gage 679655*) and set the servo terminator shut height.

6.9. Removing and Replacing the Terminator Electrical Panel Assembly

To avoid personal injury, FIRST turn off and disconnect the electrical power to the System III Leadmaker.

A. Removing the Terminator Electrical Panel Assembly

1. To remove the electrical panel from the terminator, first remove the four M4 x 8 mm screws that secure the top cover to the terminator and remove the cover. See Figure 108;

2. Remove the four M4 x 8 mm screws that secure the rear cover and remove the rear cover. See Figure 108.

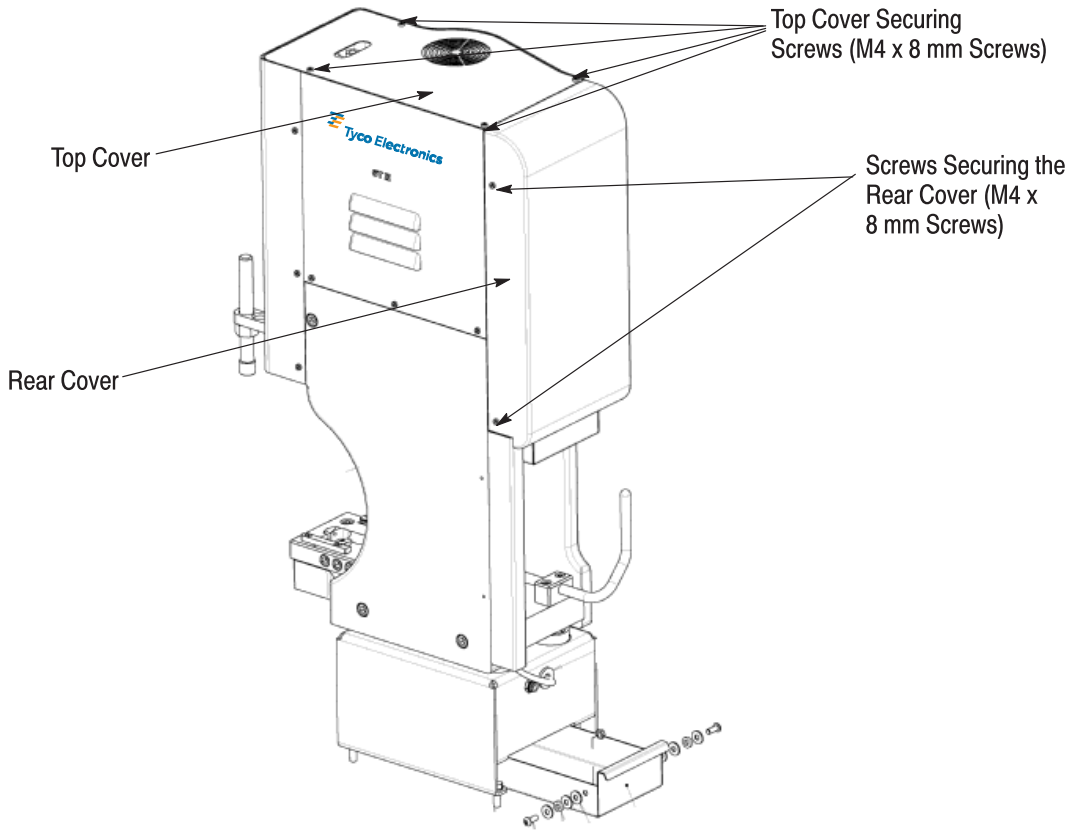


Figure 108

3. Remove the six M4 x 8 mm screws that secure the front cover to the terminator and remove the front cover. See Figure 109.

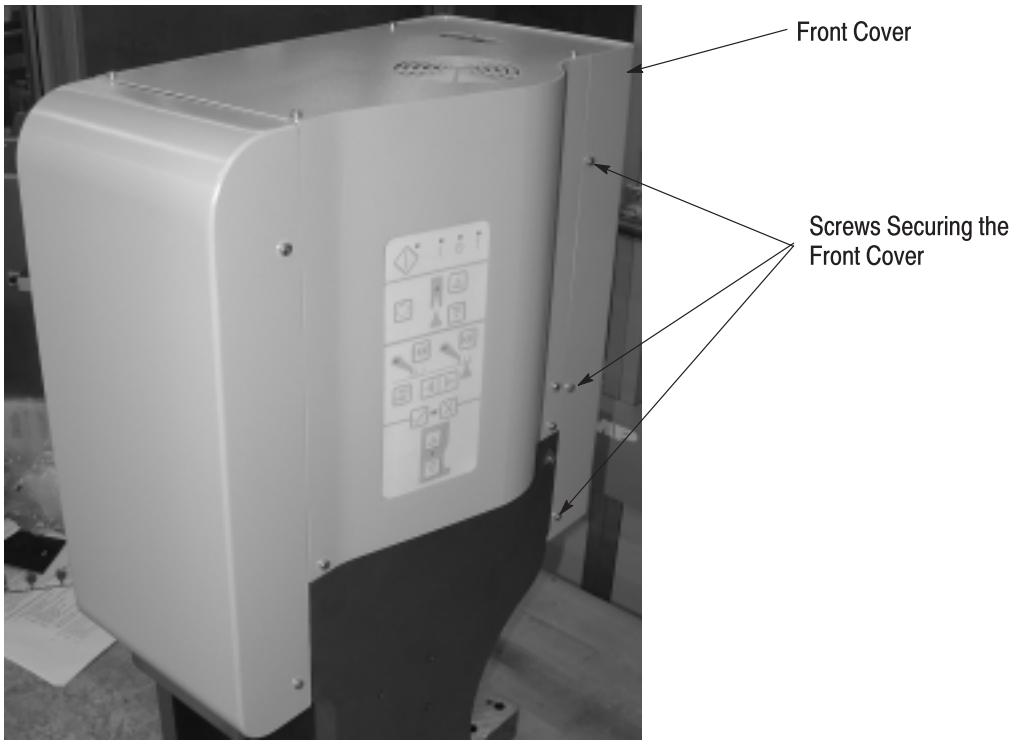


Figure 109

4. On the left–hand side of the terminator, loosen the two M4 x 8 mm screws that hold the wire guide to the side plate (see Figure 110).

5. Pulling backward, remove the wire guide.

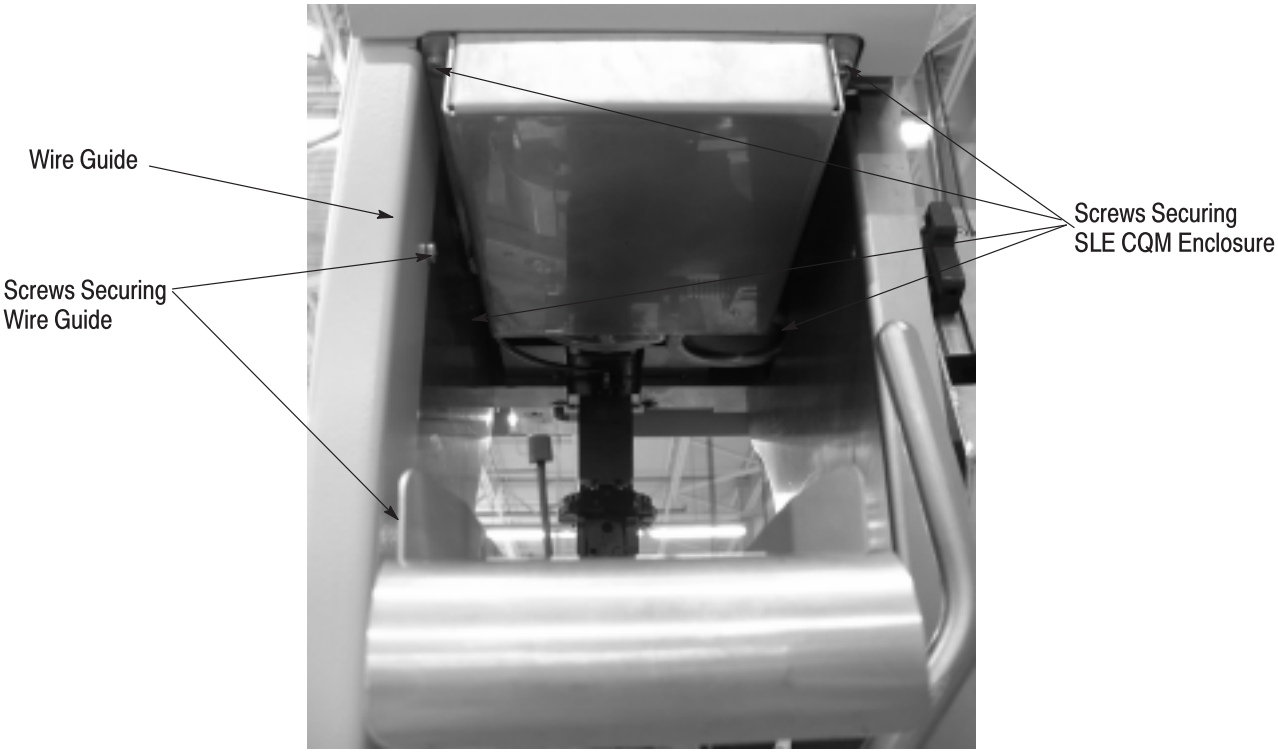


Figure 110

6. Underneath the panel, loosen the four M4 x 10 mm cap screws that secure the SLE CQM enclosure (see Figure 110).

7. Slide the enclosure towards the rear of the terminator and pull straight down to remove. If this proves difficult, *removal* of the two front screws, or all four screws, may be necessary.

8. Remove the three M4 x 8 mm screws that secure the left–hand flat upper guard.

9. Also remove the single M6 x 10 mm screw that goes through the back of the electrical panel (top left corner) horizontally into a rubber threaded grommet that is attached to the sheet metal. See Figure 111.

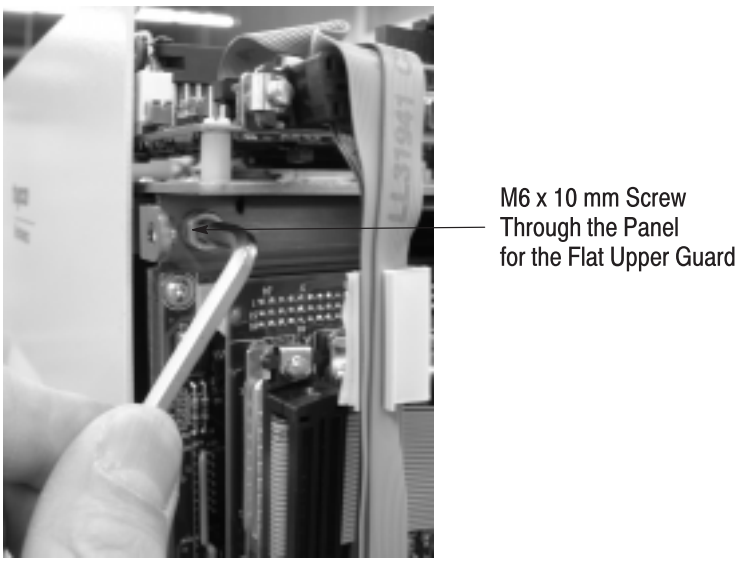


Figure 111

10. Remove the guard.

11. Remove the three M4 x 8 mm screws that secure the right–hand curved upper guard. Also remove the single M6 x 10 mm screw that goes through the top of the electrical panel (back right corner) down into a rubber threaded grommet that is attached to the sheet metal (see Figure 112).

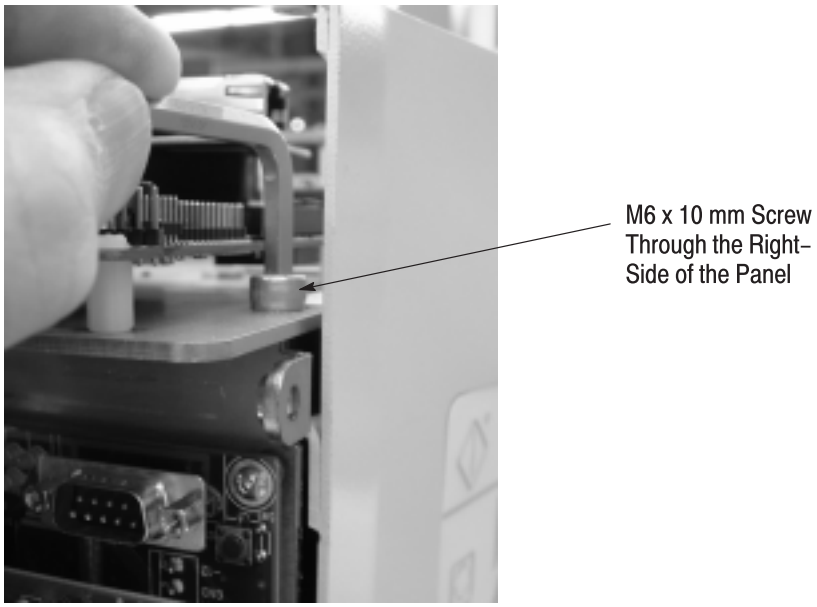


Figure 112

When the screws are all removed, carefully support the sheet metal and lift it off the side plate. Reach behind the the guard and disconnect the keypad flat–flex cable connector from the pc board. See Figure 113.

Figure 113

12. Disconnect the following cables from the panel (as viewed from the back of the terminator). See Figure 114.

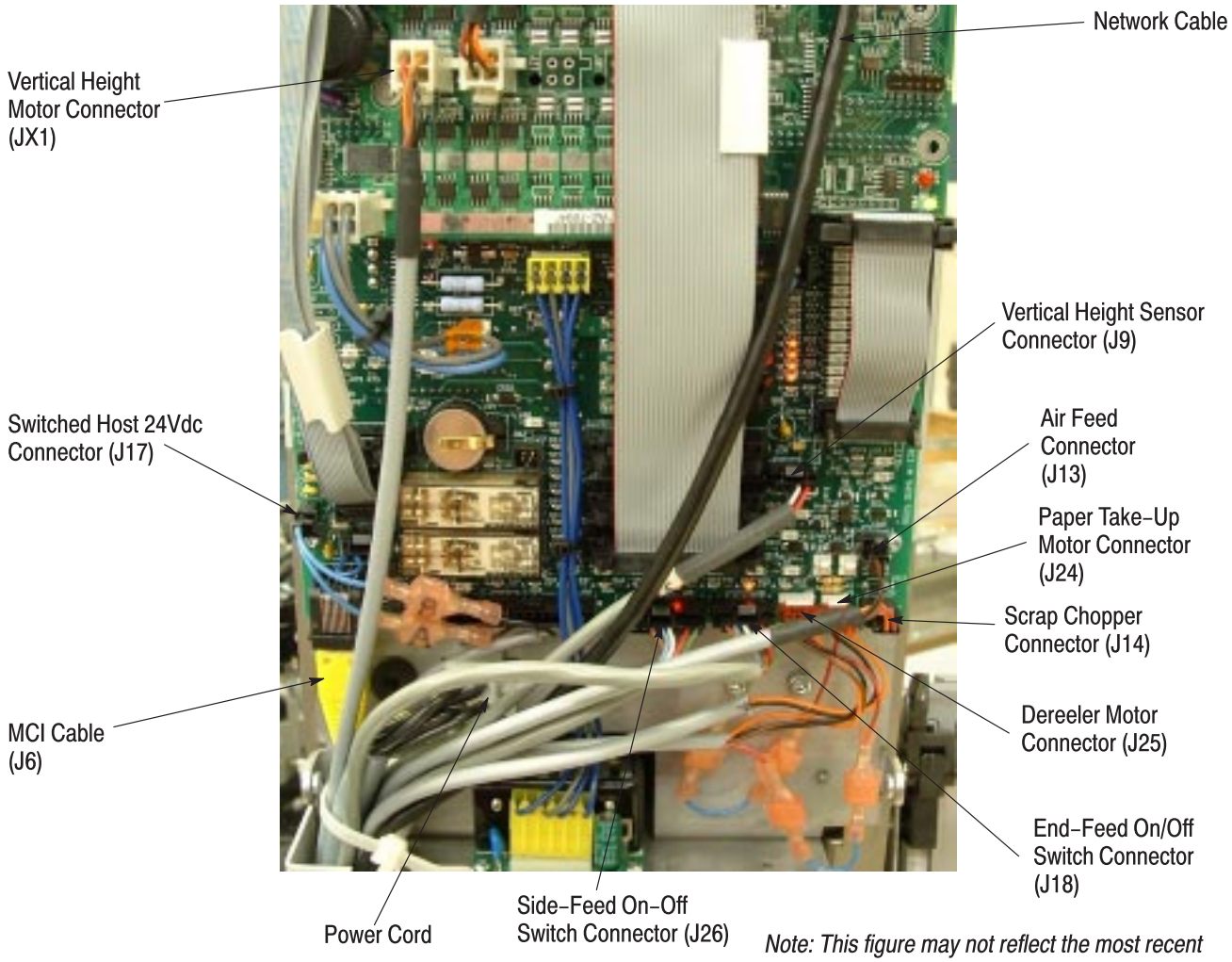


Figure 114

Note: This figure may not reflect the most recent wiring configuration.

a. Disconnect the releasable wire tie that holds the bundle of cables from the wire channel to the panel, so that the cables are no longer secured to the panel. See Figure 115.

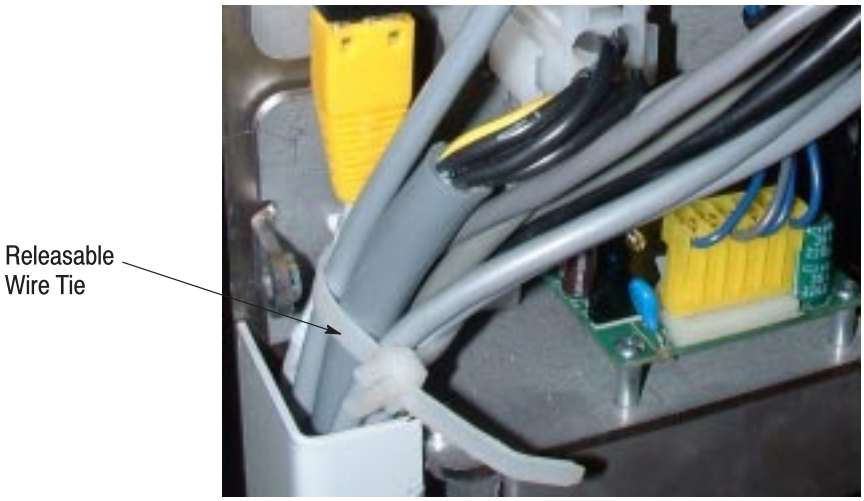


Figure 115

b. Disconnect the power cord (six–position MATE–N–LOK connector, lower left of panel).

c. Disconnect the MCI cable (RJ–45 connector on bottom left of interconnect pc board — J6).

d. Disconnect the network cable from the single board computer (RJ–45 connector on top of the panel, on the right side of the terminator — JX1 (see Figure 116).

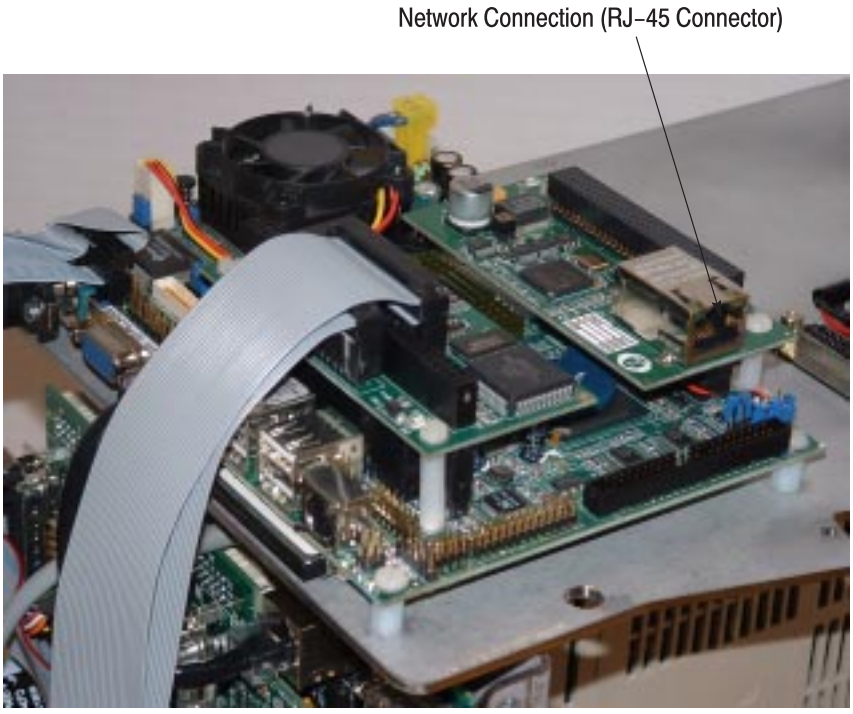


Figure 116

e. Disconnect the vertical height motor connector (four–position mini–MATE–N–LOK connector on the top left portion of panel — plugged into the motion controller PC board).

f. Disconnect the vertical height sensor connector (four–position MTE connector located at the bottom right portion of interconnect pc board — J9).

g. Disconnect the air feed and scrap chopper cable, if equipped (two– and three–position MTE connectors, J13 and J14, located on the bottom right portion of interconnect pc board).

h. Disconnect the end–feed and side–feed on/off switches, if equipped (six– and nine– position MTE connectors, J18 and J26, located along the bottom edge of the Interconnect pc board).

i. Disconnect the paper take–up and dereeler motor connections, if equipped (three– and four–position MTA connectors, J24 and J25, located along the bottom edge of the interconnect pc board).

j. Disconnect the switched host 24 Vdc connector (2–position MTE connector J17 located along the left bottom edge of the interconnect pc board). Refer to Figure 114.

13. Remove the SLE CQM from under the electrical panel. See Figure 117.

Figure 117

a. Pull straight downward to dislodge the CQM unit. It is held in place with a strip of velcro–type material.

b. Using a small flat–bladed screwdriver, loosen the two screws that secure the fifteen–position HD–20 I/O connector. See Figure 117. While supporting the CQM unit, grasp the connector and pull straight down to remove it and the unit from the panel.

c. From the front of the terminator, using an 8 mm open–end wrench, remove the right–angle coaxial sensor cable connector from the front of the CQM. See Figure 117.

14. Disconnect the following cables from the front of the terminator: (See Figure 118)

Figure 118

a. Disconnect the crimp height stepper motor connector (four–position Universal MATE–N–LOK connector) from top of panel.

b. Disconnect the crimp height encoder connector from the stepper motor encoder (ten–position MTE coupling shroud).

c. Disconnect the two cables to the two analog sensors (each has a white four–position JST connector) by gently tugging upwards on the cable, dislodging the connector from the sensor body.

d. Loosen, but don't remove, the M6 x 10 mm cap screw that holds the top front of the electrical panel to a rubber mount. Allow the panel to slide back within the constraint of the slot where the cap screw is located.

15. Disconnect the following cables from the right side of the terminator (see Figure119):

a. Disconnect the green PE wire (ring tongue) on right side plate (M4 x 6 mm brass screw).

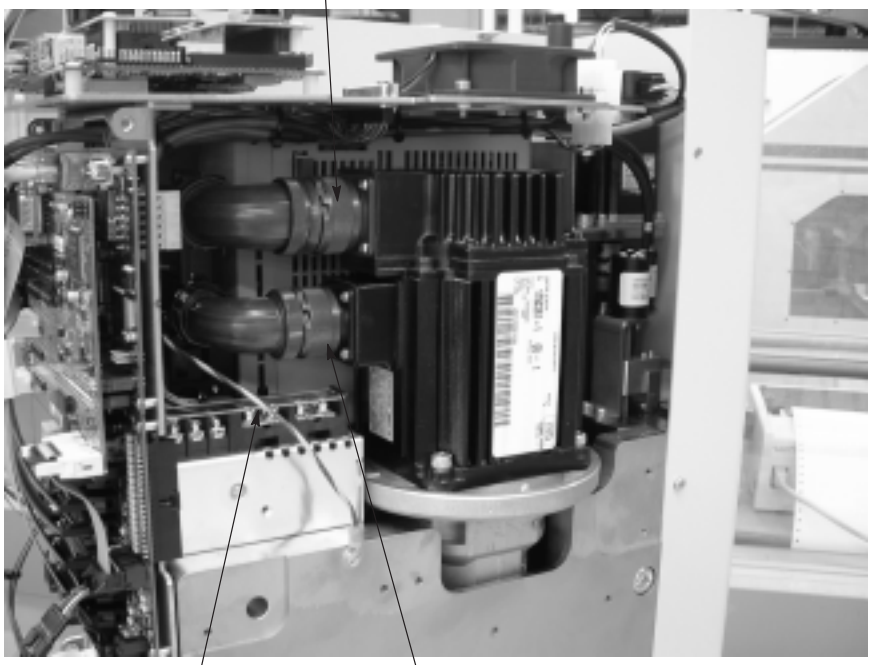


Figure 119

b. Disconnect the two circular metal–shell connectors from the main motor assembly (for the motor and encoder connections).

16. Disconnect the following cables from the left side of the terminator (Figure 120):

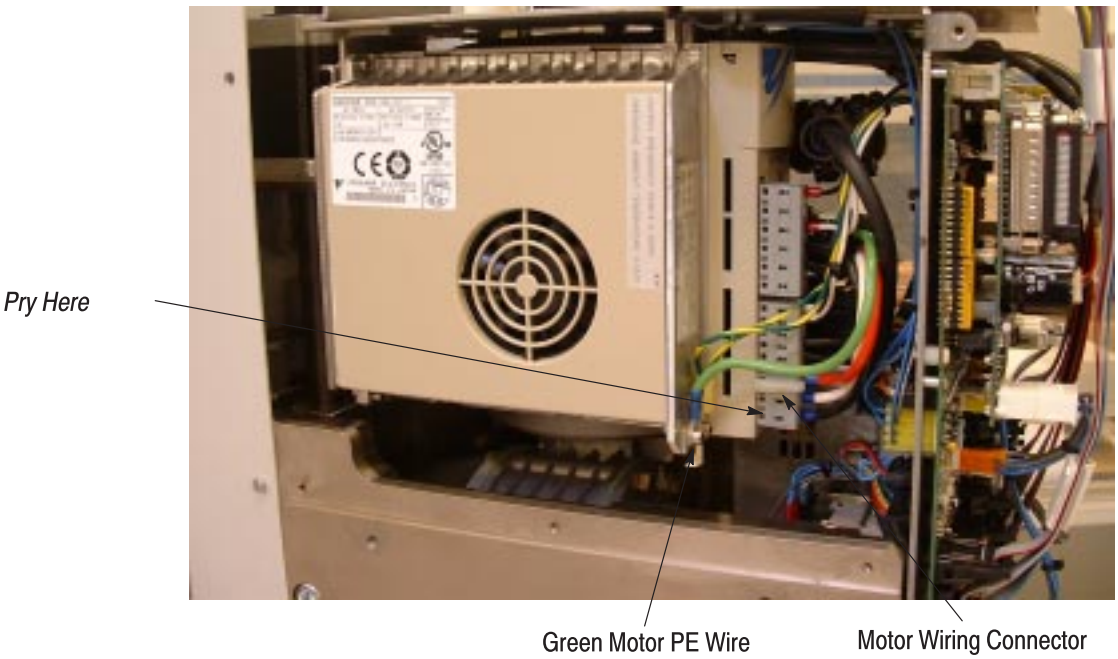


Figure 120

a. Using a flat–bladed screwdriver, pry off the main servo motor wiring connector from the bottom left corner of the servo drive. The motor wiring can now be removed from the terminator by pulling the metal circular connector from the right side of the terminator.

b. Disconnect the PE wire (ring tongue) from the bottom left corner of the main servo drive (on the heat sink – M4 x 8 mm cap screw). This wire is part of the main servo motor wiring.

17. Remove the two M6 x 8 mm button head screws from the bottom front of the panel that secure the panel to the two lower rubber mounts. See Figure 121.

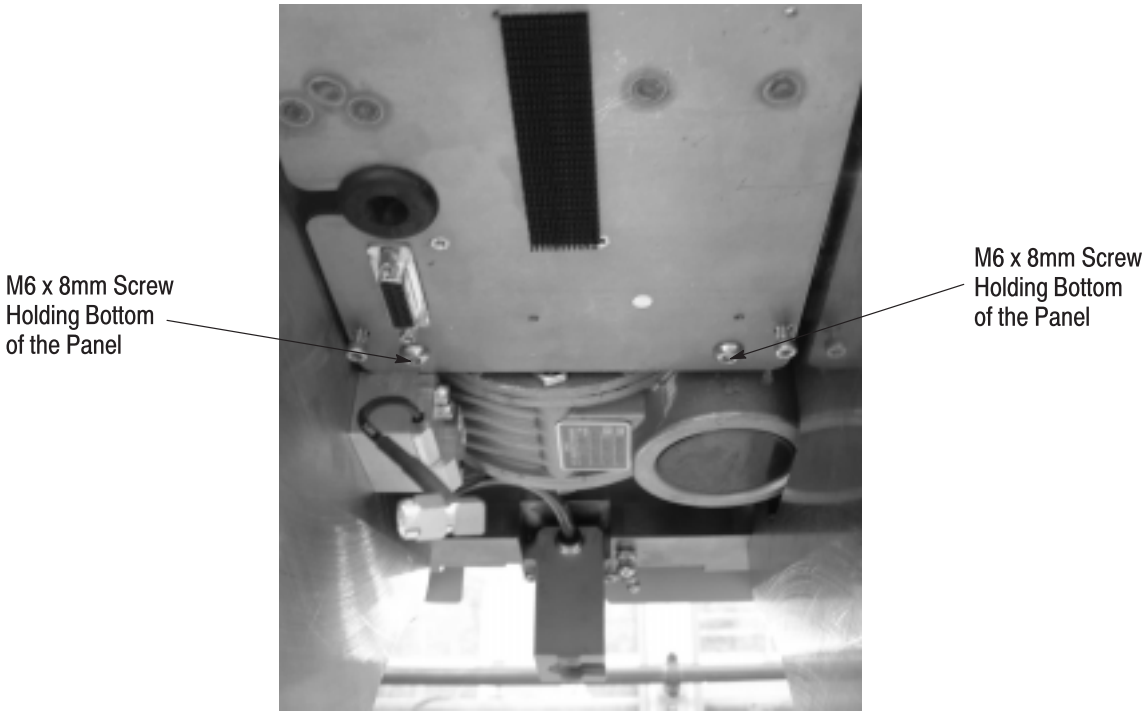


Figure 121

18. Support the panel by placing one hand underneath, and remove the M6 x 10 mm cap screw on top that was previously loosened. See Figure 122.

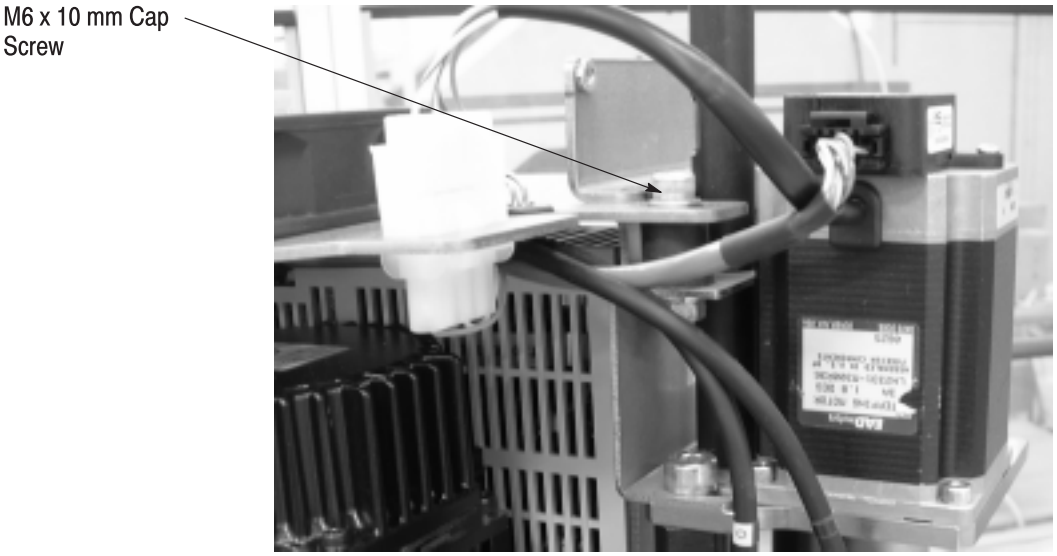


Figure 122

19. Pull the panel straight back and away from the terminator, being careful that the cables coming out of the front of the panel (for the stepper motor, encoder and analog sensors) don't get caught on anything. The encoder cable (that is still attached to the main axis servo drive) will fall out of place and come along with the panel. You can lay the panel on a flat surface, on either its right of left side. Reach inside to the connector for the encoder cable and pinching the two spring latches (located on both sides of the connector) release and remove the encoder cable from the panel.

B. Re–Installing the ST III Electrical Panel

1. Lift the new panel, supporting it with a hand underneath and guide it onto the frame of the terminator, using the other hand to make sure the three cables coming out of the end of the panel don't get caught anywhere. Start, but do *not* tighten, the single M6 x 10 mm cap screw through the slot in the top front of the panel and into the rubber mount. See Figure 122.

2. Pushing the panel "up" so that it contacts the rubber mounts, begin threading both of the M6 x 8 mm button head screws from the bottom front of the panel, into the mounts. Once they are started, tighten both screws. See Figure 121.

3. Take the main motor encoder cable, and insert the small connector behind the panel from the right side. (Refer to Figure 119 and Figure 120.) Position this cable between the black and white wires power wiring for main servo drive, and the drive itself. Place the circular metal–shell connector onto the encoder connection (top one) and tighten it. Then loop the other end of the cable under the servo power wiring and over to the lower right corner of the servo drive, where you can push the gray connector onto the drive. Two audible clicks can be heard as the two spring latches fully seat.

4. Next take the main motor cable, and also insert it behind the panel from the right side, but place it to the other side of the servo drive power wiring (between the back of the panel and the wiring). Refer to Figure 119 and Figure 120. Tighten the circular metal–shell connector onto the motor connection (bottom one) and push the other one (gray plastic) onto the connector on the servo drive, located on the left corner. Fasten the green PE wire to the drive (on the heat sink, with the ring tongue pointing up) with the M4 x 8 mm cap screw.

5. While pushing the panel forward against the side plates, tighten the M6 x 10 mm cap screw that holds the top front of the electrical panel to the rubber mount. See Figure 122.

6. Re–connect the following cables at the front of the terminator. Refer to Figure 123.

Figure 123

a. Re–connect the crimp height stepper motor connector (four–position Universal MATE–N–LOK connector). See Figure 123.

b. Re–connect the crimp height encoder connector to the stepper motor encoder (ten–position MTE coupling shroud).

c. Re–connect the two cables to the two analog sensors (each has a white four–position JST connector). The cable marked “I” (for inner) goes to the sensor that is closest to the centerline of the machine (looking at the machine from the front); the cable, marked “O” (for outer) goes to the sensor that is further from the centerline of the machine. Once in position, push down with a small tool on the top of the sensor connectors to make sure they are fully seated into the sensor body.

7. Find the green/yellow PE wire that comes from the second PE screw on the servo drive (with a ring tongue terminal) and, if equipped, the green ground wire from the feeder cable (ring tongue terminal) and fasten both to the outside of the right side plate with the single M4 x 6 mm brass screw. Refer to Figure 124.

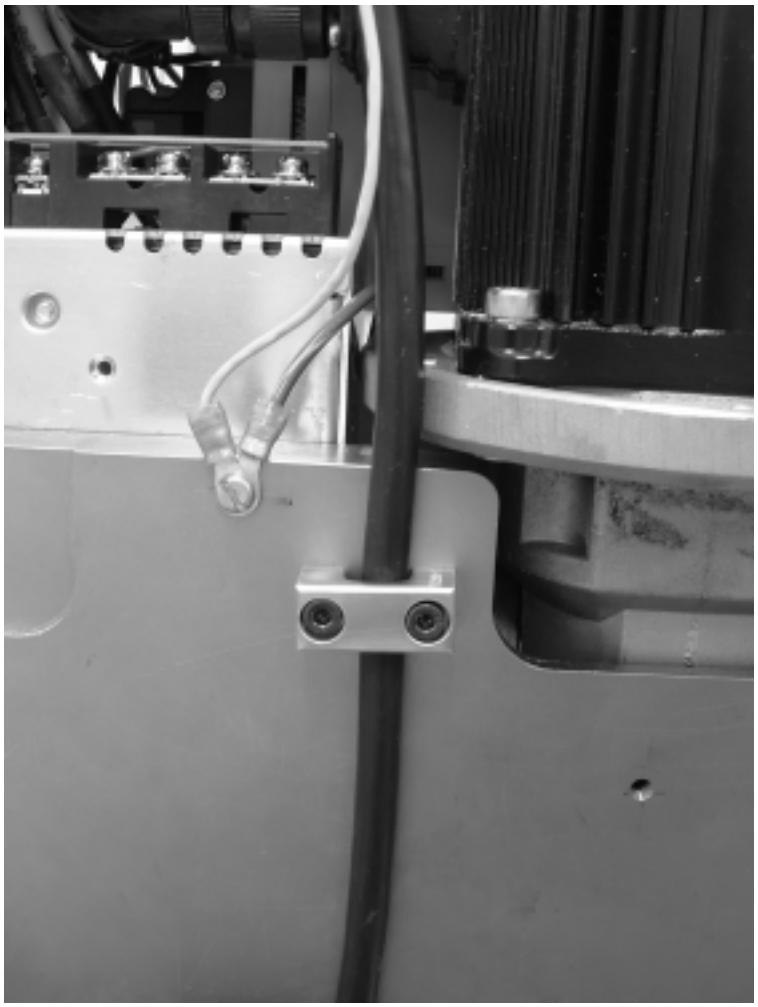


Figure 124

8. See Figure 125 and re–connect the following cables to the panel (as viewed from the rear of the terminator):

   a. Re–connect the power cord (six–position MATE–N–LOK connector) on the lower left of panel.

   b. Re–connect the MCI cable (RJ–45 connector on bottom left of interconnect pc board, J6).

   c. Re–connect the network cable from the single board computer (RJ–45 Connector on the top of panel, on right side of terminator). Refer to Figure 116.

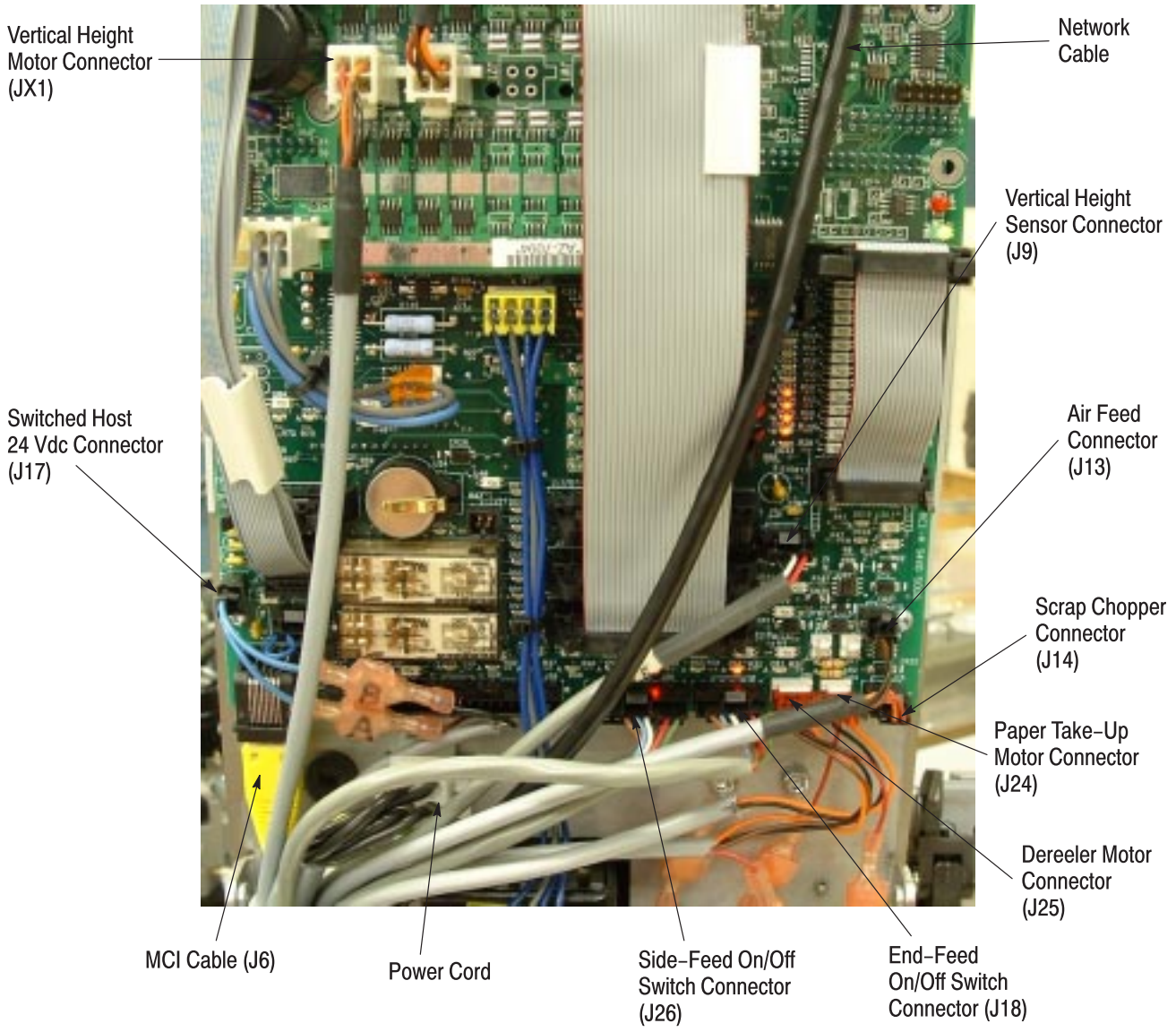
   d. Re–connect the vertical height motor connector (four–position mini–MATE–N–LOK connector).

   e. Re–connect the vertical height sensor connector (four–position MTE connector located at the right lower–portion of interconnect pc board, J9).

   f. Re–connect the air–feed and scrap chopper cable, if equipped (two– and three–position MTE connectors, J13 and J14, located on the bottom right portion of interconnect pc board).

   g. Re–connect the end–feed and side–feed on/off switches, if equipped (six– and nine–position MTE connectors, J18 and J26, located along the bottom edge of the interconnect pc board).

   h. Re–connect the paper take–up and dereeler motor connections, if equipped (three– and four–position MTA connectors, J24 and J25), located along the bottom edge of the interconnect pc board.



Note: This figure may not reflect the most recent wiring configuration.

Figure 125

i. Re–connect the switched host 24Vdc connection (two–position MTE pin header, J17, located along the lower left edge of the interconnect pc board. See Figure 125. Note that if the leadmaker wiring for the switched 24Vdc connection has two Ultrafast connectors (labeled “A” and “B”), use the supplied wire jumper (two wires each with an Ultrafast tab joined to a two–position MTE receptacle housing), and connect:
– the receptacle marked “A” to the tab marked “A”;
– the receptacle marked “B” to the tab marked “B”; and
– the MTE receptacle to J17 on the pc board. See Sigure 126.

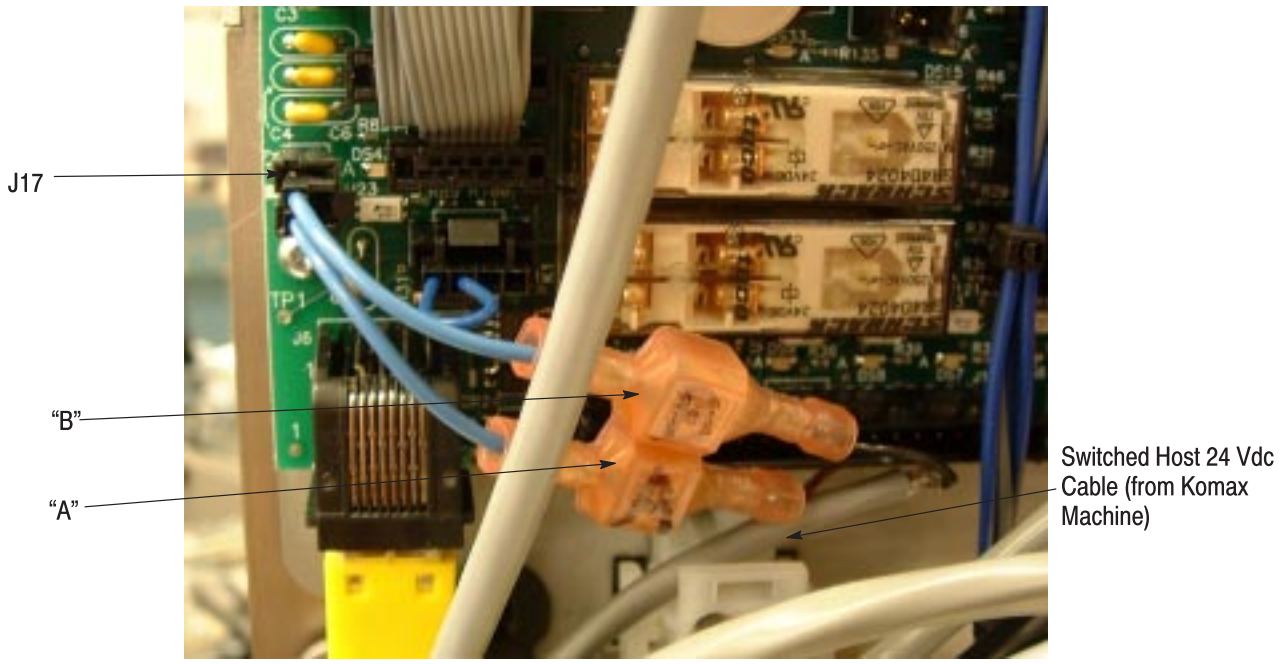


Figure 126

9. Re–Install the SLE CQM under the electrical panel as follows:

   a. If the new panel does not have a strip of velcro–type material underneath it to hold the SLE CQM, take a new strip (supplied with kit P/N 1976372–1) and cut it to the same length as the strip that is already on the SLE CQM.

   b. Aligning the new strip with the existing one, push it onto SLE CQM with the adhesive side up.

   c. Holding the SLE CQM under the panel with one hand, push the I/O connector onto its panel–mounted mate.

   d. Using a small flat–bladed screwdriver, tighten the two screws that secure the connector. Refer to Figure 127.

Figure 127

e. From the front of the terminator, secure the coax sensor cable onto the SLE CQM, using an 8 mm open–end wrench; the coax cable should be exiting the right–angle connector towards the left side plate of the terminator. Refer to Figure 128.

Figure 128

f. Using a rag, wipe off any oil or foreign material from the bottom of the panel.

g. Pull off the paper from the adhesive surface of the velcro–type material on the SLE CQM. Align the back edge of the CQM so that it is nearly flush with the back edge of the panel, and firmly push it up against the underside of the panel, so that the upper strip of velcro–type material sticks to the underside of the panel.

10. Re–install the sheet–metal guarding as follows:

a. From underneath the panel, place the SLE CQM enclosure up over the unit and onto the four M4 x 10 mm cap screws. See Figure 129.

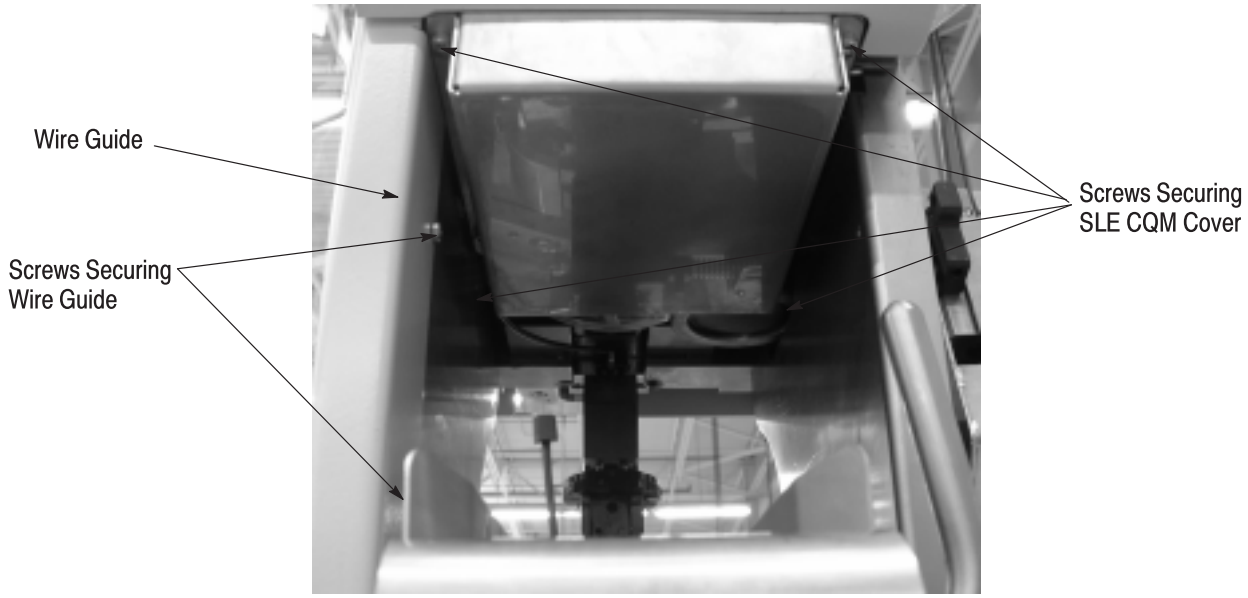


Figure 129

b. Slide the cover all the way forward, checking that there are no wires or cables pinched under the enclosure. Tighten the four screws (Figure 129).

c. Place the wire channel over all the wiring that runs down along the left side plate.

d. Capture the wire and slide the channel under the two M4 x 8 mm mounting screws.

e. Push the channel against the side plate, making sure none of the wiring is pinched at the top or at the bottom, and tighten the screws.

f. Secure the cabling to the panel with the releasable wire tie. See Figure 130.

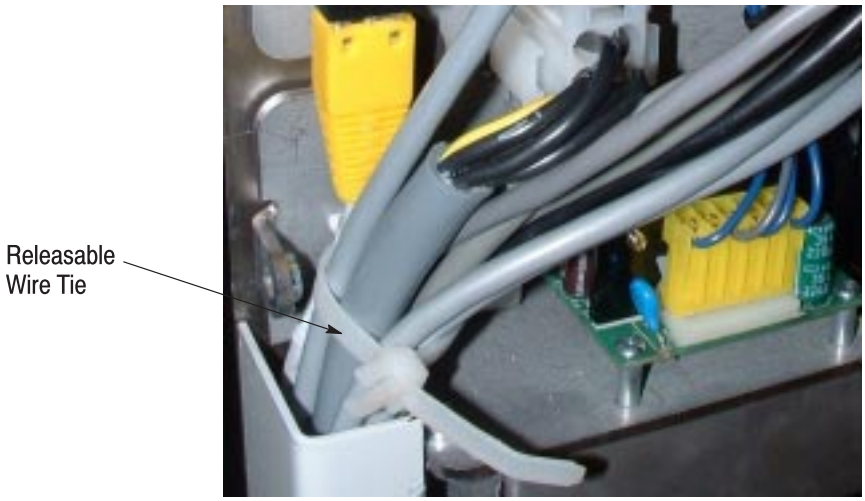


Figure 130

g. Holding the left–hand flat upper guard in position on the terminator (Figure 108) ,start all three M4 x 8 mm screws and the M6 x 10 mm screw that goes through the back of the electrical panel (top left corner) horizontally into the rubber threaded grommet that is attached to the sheet metal.

h. When the guard is in position, tighten all of the screws.

i. While holding the right–hand curved upper guard close to the terminator, reach behind the guard to attach the MTE connector on the flat–flex cable for the keypad to either twenty–position connector poking through the cutout of the panel. See Figure 131.

Figure 131

j. Then place the guard onto the terminator and start all three M4 x 8 mm screws and the M6 x 10 mm screw that goes through the top of the electrical panel (back right corner) down into a rubber threaded grommet that is attached to the sheet metal. See Figure 112. When the guard is in position, tighten all of the screws.

k. Place the front cover onto the terminator and start all six M4 x 8 mm screws.

l. When the guard is in position, tighten all of the screws.

m. Place the rear cover onto the terminator (see Figure 108 and Figure 109). Start all four M4 x 8 mm screws. When the guard is in position, tighten all of the screws.

n. Place the sheet metal top cover onto the terminator and start all four of the M4 x 8 mm screws. With the cover in position, tighten all of the screws.

6.10. General Preventive Maintenance

NOTE

These instructions deal with cleaning and maintenance of the terminator **only.**

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

Preventive maintenance consists primarily of cleaning, maintenance, and lubrication.

DANGER

To avoid personal injury, electrical and pneumatic power must be DISCONNECTED and secured to prevent unauthorized re–connection.

6.11. Cleaning and Maintenance

A. Daily Maintenance

- Use a soft brush or industrial vacuum to remove residual contact or carrier strip scrap or other loose debris from the applicator mounting areas.

CAUTION

Do not use compressed air to clean debris. Debris could fly into areas where it causes mechanical or electrical problems or premature wear.

DANGER

In addition, debris could fly into the eyes of the operator.

- Empty the carrier strip scrap tray. This procedure is recommended for the beginning of each shift, if multiple shifts are run in a day.

B. Weekly Maintenance

- Remove grease and grime from applicator mounting surfaces with a soft non–linting rag lightly saturated with a thin oil.
- Check for loose components in the base plate assembly, actuating handle mechanism, and ram adapter assembly.
- Inspect CQM cable support tubing and hardware. Tighten loose hardware.

C. Monthly Preventive Maintenance

NOTE

Perform these procedures monthly OR every 500,000 to 700,000 termination cycles.

NOTE

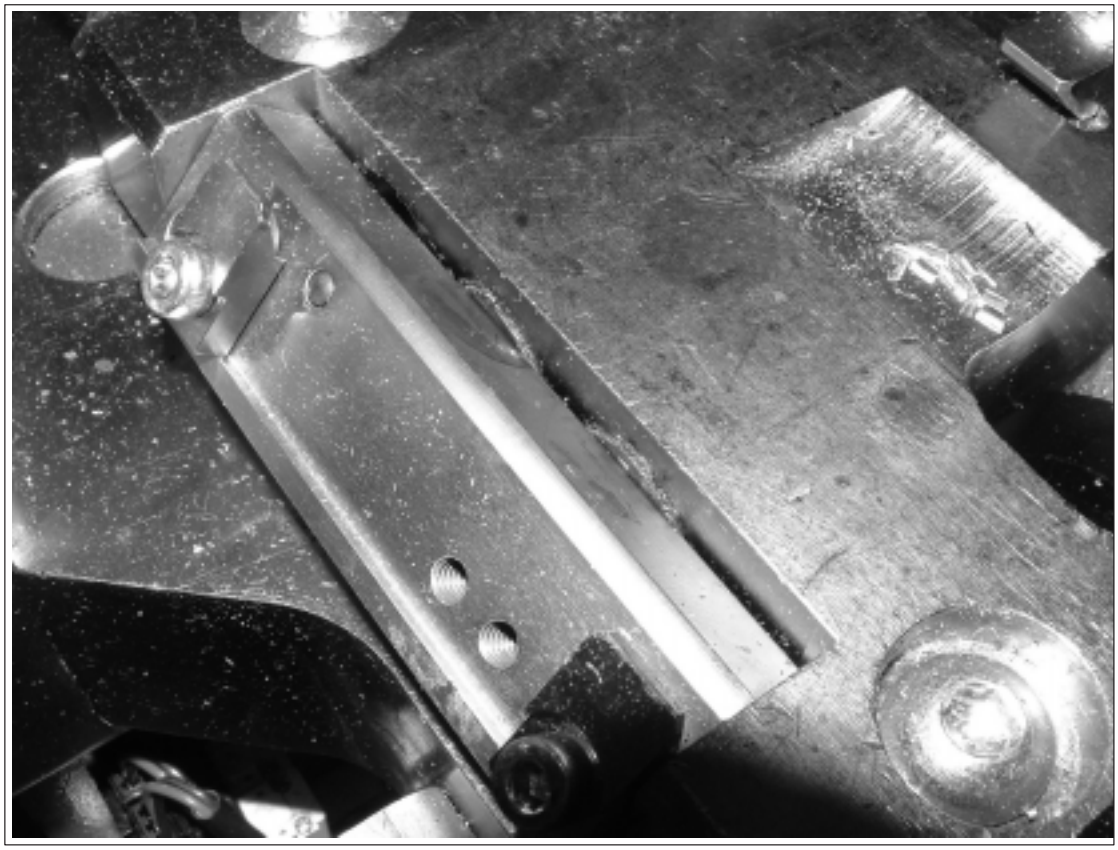
Before shutting down the machine for monthly maintenance of terminators, remove the applicators and use the terminators' jog button to move the terminator ram to approximately its lowest position.

- Lubricate the main crankshaft bearing with grease via the fitting at the bottom of the frame's front plate. Wipe fitting clean with a soft rag before and after applying grease. See the table in Figure 132 for grease recommendations.
- Remove front cover. Check the terminator ram for play. Play should be barely perceptible. If play is excessive make adjustment per the terminator section.
- With the cover still removed and the terminator ram still down, apply a small amount of grease to the track surfaces at the top of each exposed linear bearing rail. See the table in Figure 132 for grease recommendations.
- With cover still removed, lubricate the adjust screw with a small amount of grease via fitting on the front of the terminator ram. Wipe fitting clean with a soft rag before and after applying grease. See the table in Figure 132 for grease recommendations.
- Reattach front cover.
- If desired, clean painted covers with a soft cloth and an approved general purpose industrial cleaner. Do not spray cleaner directly on the terminator. Instead spray cleaner on the rag and wipe soiled painted surfaces. If desired, metal surfaces can be cleaned with a rag lightly saturated with a thin oil.

CAUTION

Spraying cleaners, oils, or other liquids directly onto the terminator could cause damage to electrical components.

- Wipe a thin film of grease on the base plate eccentric where it engages the locking plungers. See the photograph in Figure 132. Remove any excess from other surfaces.



GREASE SELECTION TABLE FOR AMP-O-LECTRIC ST TERMINATOR		
Choice	**Description of Grease(s)**	**Preference**
1st choice	Chevron Ultra-Duty EP NGLI 2	**Most preferred.** Factory applied. Thoroughly tested.
	Pennzoil Pennlith Ultra EP NGLI 2, or Chevron Ulti-Plex EP NGLI 2 Caltex Ultra-Duty EP NGLI 2	Preferred Equivalents (based on the following attributes) : - Timken OK Load Test >= 70 lbs - Four Ball Weld Point Test >= 315 kg - Base Oil Viscosity >= 300cSt@40°C - Significant EP and adhesion additives
2nd choice	Conoco/Phillips/76 Multiplex Red NGLI 2 Citgo OverDrive HD NGLI 2	May be satisfactory; performance approaches preferred lubricants - Timken OK Load Test >= 60 lbs - Four Ball Weld Point Test >= 315 kg - Base Oil Viscosity >= 220cSt@40°C - Significant EP and adhesion additives
3rd choice	Lithium based, NGLI grades 1, 1.5, and 2, extreme pressure grease	May be satisfactory if applied more frequently; may reduce terminator life depending on severity and conditions of use.
Not Acceptable	Light greases (lower than NGLI grade 1)	May not maintain lubrication film at moderate or high loads
Not Acceptable	*Non*-lithium-based greases	Not compatible with factory grease

Figure 132

Available grease suppliers:	
For Chevron :	**For Pennzoil :**
REIT Lubricants Company 899 Mearns Road Warminster, PA 18974 Phone: 800-227-1808 www.reitlube.com	Purvis Brothers, Inc. 321 Mars-Valencia Rd Mars, PA 16046 www.oil-store.com

NOTE

Refer to the maintenance instructions in the various sections of this manual.

6.12. System III Feeder Maintenance

Every million cycles of feeder operation, perform the following recommended preventive maintenance procedures:

1. Remove electrical power from machine.
2. Disassemble the rear guard cover, and remove feeder guard.
3. Clean any accumulated debris from the ballscrew, and linear rails.
4. Inspect for any damaged parts, or excessive bearing clearance.
5. Lightly lubricate ballscrew and linear rails with Lithium EP NLGI 2 grease (Figure 133).

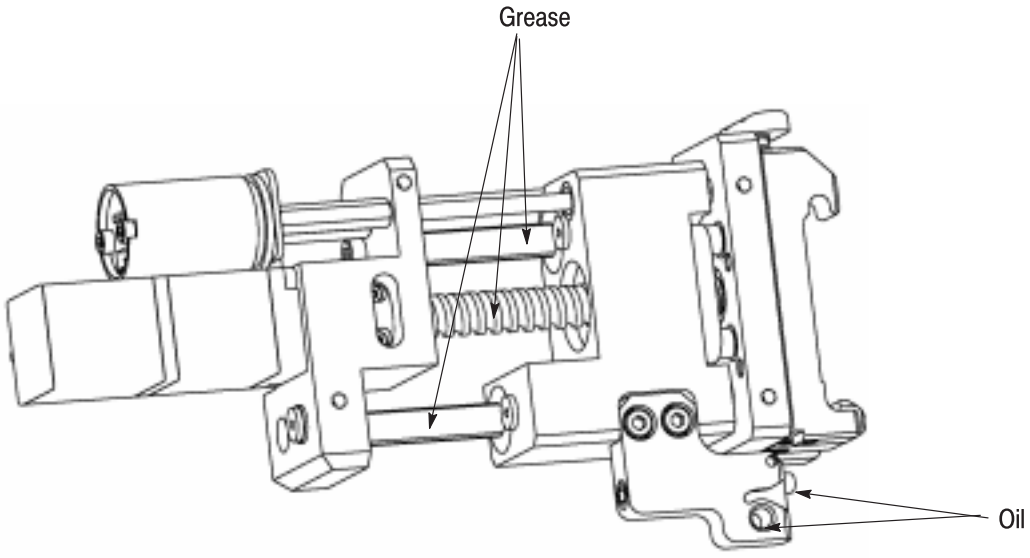


Figure 133

6. Apply light machine oil to feed arm plunger, and pivot hole.
7. Reassemble guards, and calibrate feeder.

DANGER

The feeder should not be operated without guards in place. Feeder guard is an integral structural element required for proper function of feeder.

Every ten million cycles of feeder operation, perform the following recommended preventive maintenance procedures:

1. Disconnect electrical power from machine.
2. Disassemble the rear guard cover, and remove feeder guard.
3. Loosen coupler clamp screws, and remove servo motor.
4. Remove coupler from servo motor, and install new coupler. Note that coupler set–up dimension is shown on assembly drawing.
5. Reassemble servo motor, and tighten remaining coupler screws.
6. Reassemble guards, and calibrate feeder.
7. Connect power.

Trouble shoot the feeder as described in Figure 134.

TROUBLESHOOTING

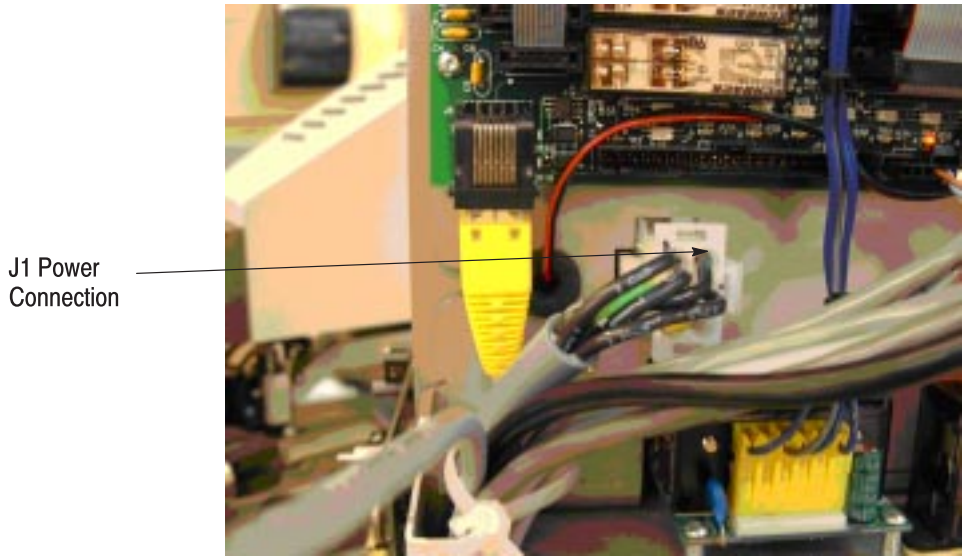
PROBLEM	PROBABLE CAUSE	REMEDY
Feeder does not read data correctly	Dirt shorting out applicator memory	Remove memory and clean
	Feeder removed before data transfer is complete	Reconnect and allow time for all the flashing read indicator lights on keypad to turn off.
Feed finger does not align with track.	Mis–adjustment of feeder amount bracket.	Loosen bracket, install feeder moving assembly until the feed finger aligns correctly. Carefully remove feeder and tighten mounting hardware.
Terminal feed position changes between terminators/machines	Calibration not performed exactly the same between machines	Perform feeder calibration on both machines.
Terminals not being properly fed	Retract the distance set, too short	Adjust retract position until feed finger properly picks up feed index hole. May need to test feed at speed.

Figure 134

7. ELECTRICAL REFERENCE

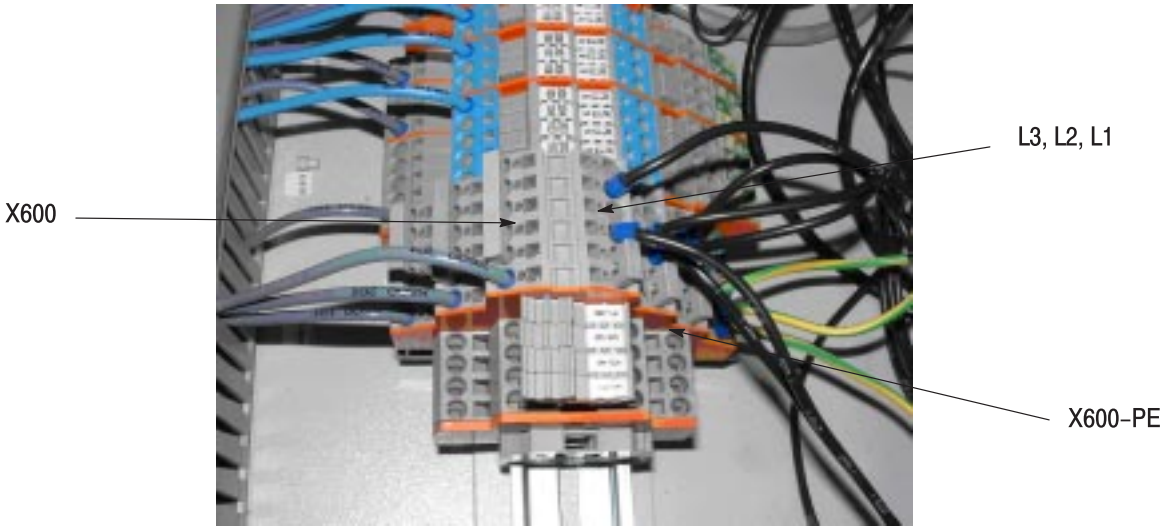
Servo Terminator III Connections

After the cable is routed through the base machine, it must be connected to the ST III and the AMPOMATOR System III AC power. For power cable connection to the ST III electrical panel, refer to Figure 135.



ST III Electrical Panel (Rear Lower Left)
Figure 135

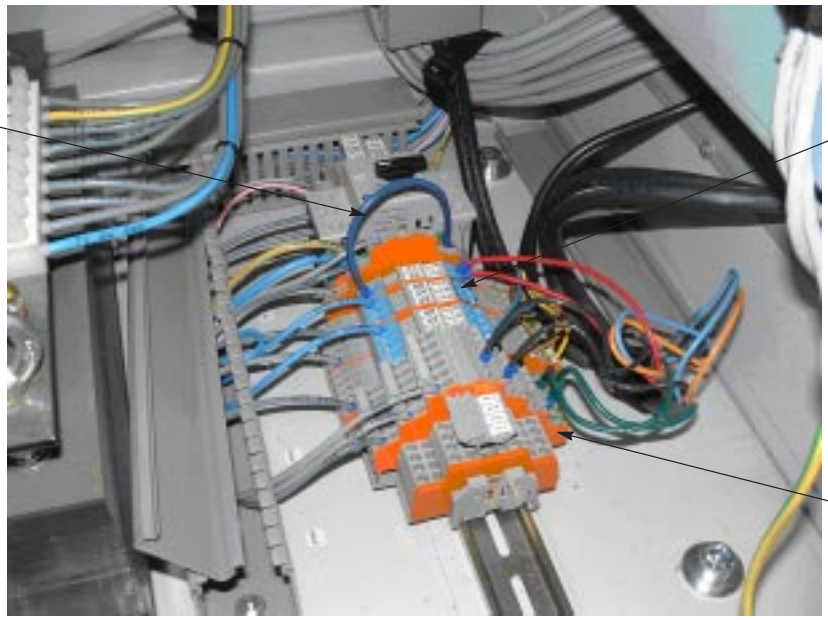
Refer to Figure 136 for machines that have the following input voltages: 210V, 230V, 420V, 440V, 460V, and 480V.



Connection Table For Input Voltages: 210V, 230V, 420V, 440V, 460V, and 480V				
Power Wiring -- Side 1 Station 1	Terminator Power Cable 1752478-1	X600-L2 -- Wire #4	X600-L1 -- Wire #3	X600-PE Green/Yellow
Power Wiring -- Side 2	Terminator Power Cable 1752478-1	X600-L2 -- Wire #4	X600-L3 -- Wire #3	X600-PE Green/Yellow
Power Wiring -- Side 1 (433/L) Station 1.2	Terminator Power Cable 1752478-1	X600-L1 -- Wire #4	X600-L3 -- Wire #3	X600-PE Green/Yellow

Figure 136

Figure 137 contains the input voltages for 380V and 400V machines.



Connection Table for Input Voltages : 380V and 400V (Neutral Jumper Wire Required)				
Power Wiring –– Side 1 Station 1	Terminator Power Cable 1752478–1	X600–L3 –– Wire #3	X610–N –– Wire #4	X600–PE Green/Yellow
Power Wiring –– Side 2	Terminator Power Cable 1752478–1	X600–L2 –– Wire #3	X610–N –– Wire #4	X600–PE Green/Yellow
Power Wiring –– Side 1 (433/L) –– Station 1.2	Terminator Power Cable 1752478–1	X600–L1 –– Wire #3	X610–N –– Wire #4	X600–PE Green/Yellow

Figure 137

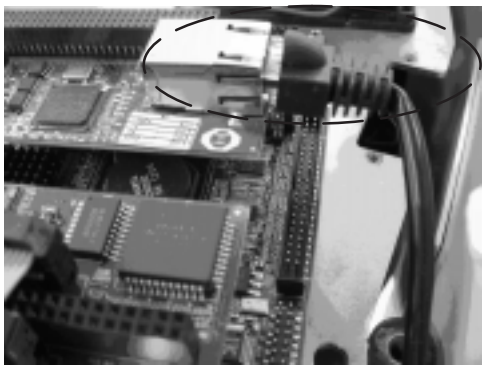
Figure 138 contains the control power (typical for all input voltages).

ST III Control Power Connection Internal to AMPOMATOR System III Control Cabinet (Center)

Connection Table for Control Power (All Input Voltages)			
Power Wiring –– Side 1	Terminator Power Cable 1752478–1	X102–204 –– Wire #1 (L1)	X103–203 –– Wire # 2 (N)
Power Wiring –– Side 2	Terminator Power Cable 1752478–1	X102–104 –– Wire #1 (L1)	X103–204 –– Wire # 2 (N)
Power Wiring –– Side 1 (433/L) –– Station 1.2	Terminator Power Cable 1752478–1	X102–304 –– Wire #1 (L1)	X103–304 –– Wire # 2 (N)

Figure 138

After ethernet cable (1752294–2 is routed through the base machine, it must be connected to the ST III and the ethernet switch that is mounted to the AMPOMATOR System III control cabinet. For the ethernet cable connection to the ST III control panel, refer to Figure 139.

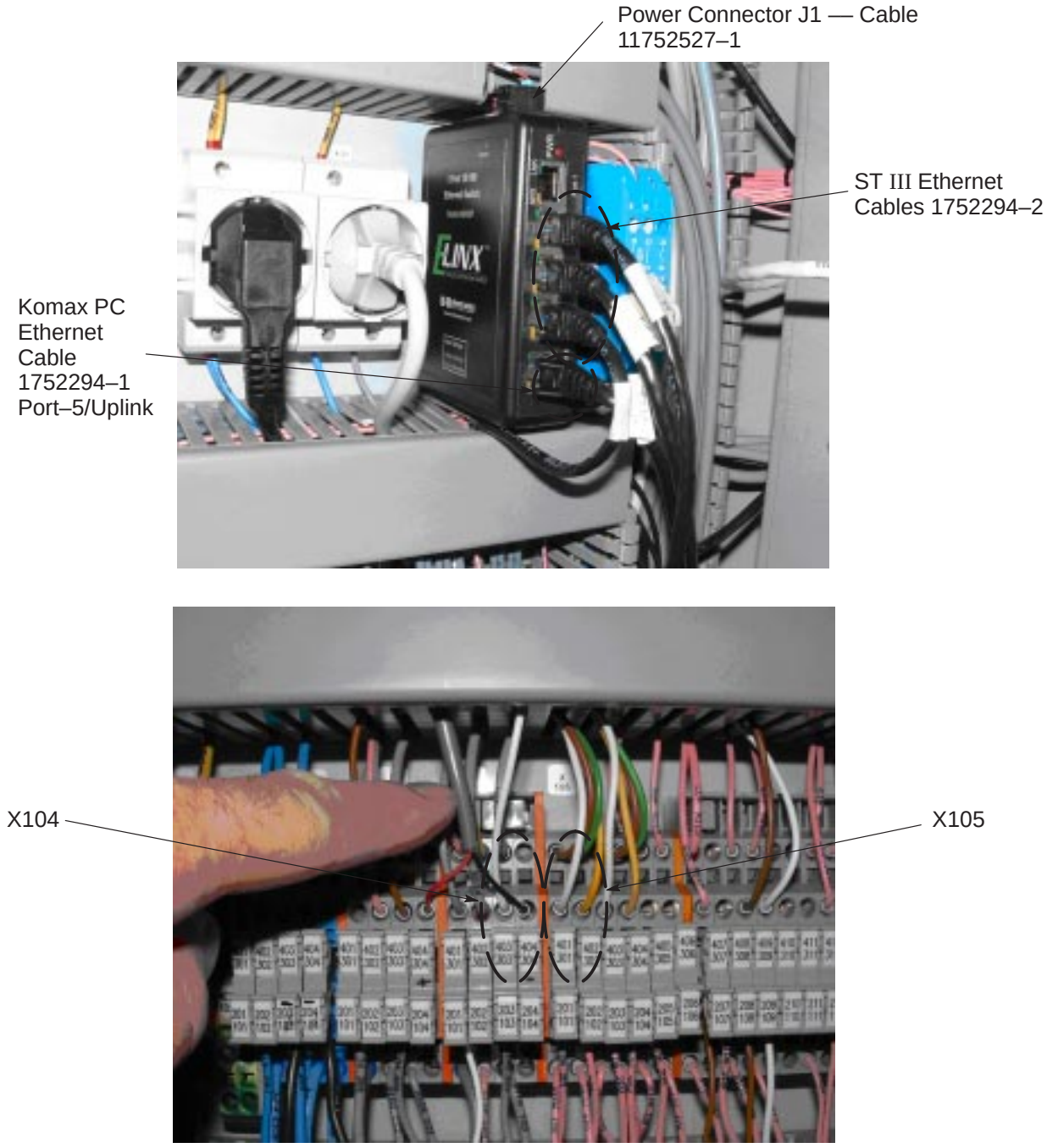


Ethernet Cable Connected to ST III Control Panel (Top Right) (Network Daughter Board Mounted to Single Board Computer)

Ethernet Cable Connection Table To Ethernet Switch	
Side–1, Station 1	Port 2
Side–2	Port 3
Side–1, Station 1.2 (433/L)	Port 4
PC Connection	Port 5

Figure 139

For the ethernet cable connection to the AMPOMATOR System III ethernet switch, refer to Figure 140.



Ethernet Switch Power Cable 1752527–1	X105–304 Black Wire	Black Wire (–) To (–) Terminal J1 on Ethernet Switch
	X104–304 Red Wire	Red Wire (+) To (+) Terminal on Ethernet Switch

Figure 140

The ethernet switch must be connected to the Komax PC with Ethernet Cable (1752294–1). See Figure 140 and Figure 141.

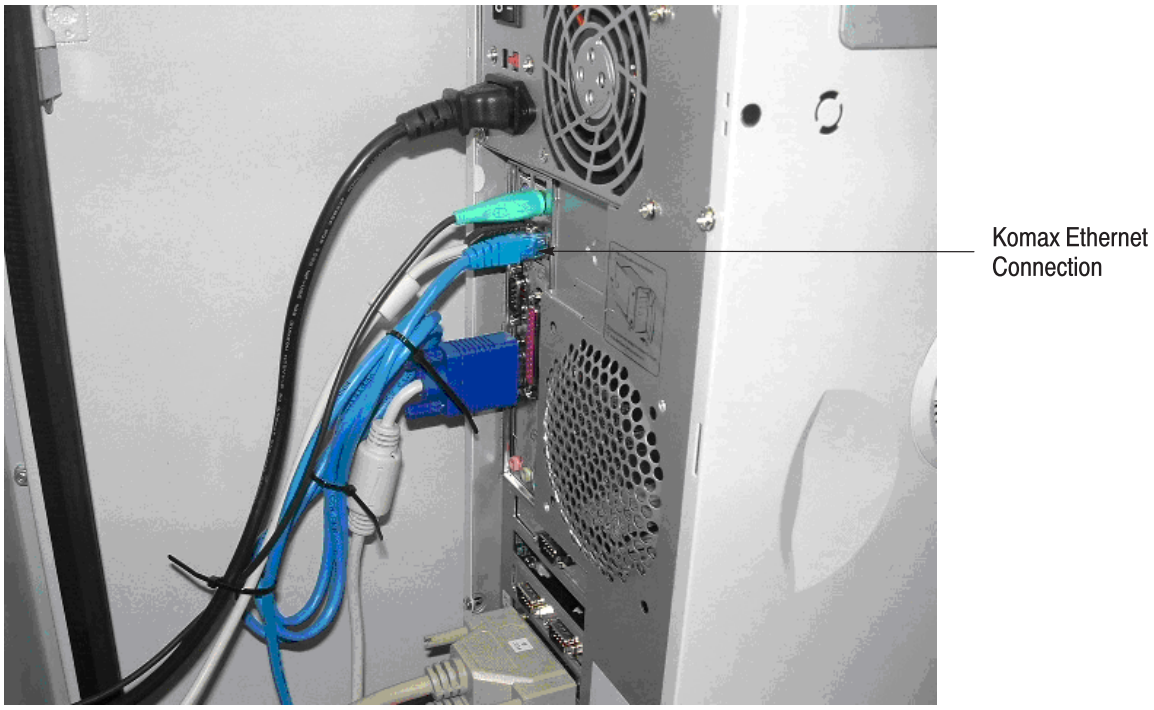


Figure 141

MCI Cable Connections for ST III

The MCI cables, provided on the base machine, must be connected to the ST III and the Komax MRS board. See Figure 142.

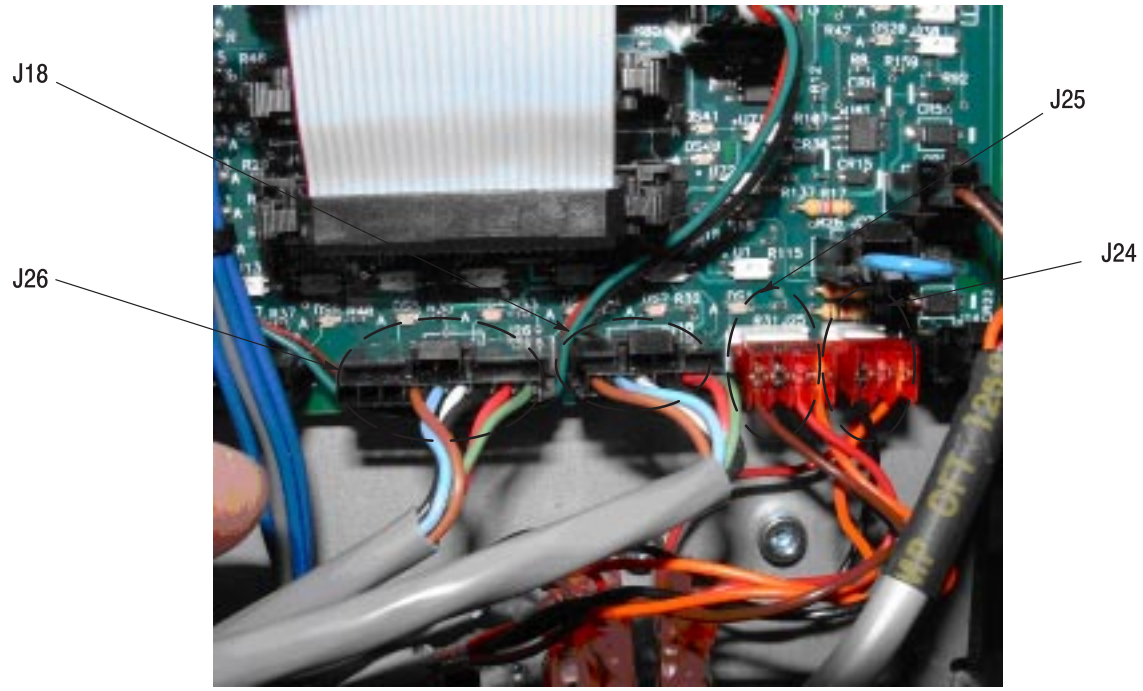
MCI Cable Connection Table

Komax MCI Cable Side-1, Station 1	529474-4	ST III J6	Komax MRS Board CH 3
Komax MCI Cable Side-2	529474-4	ST III J6	Komax MRS Board CH 7
Komax MCI Cable Side-1, Station 1.2 (433/L)	529474-4	ST III J6	Komax MRS Board CH 5

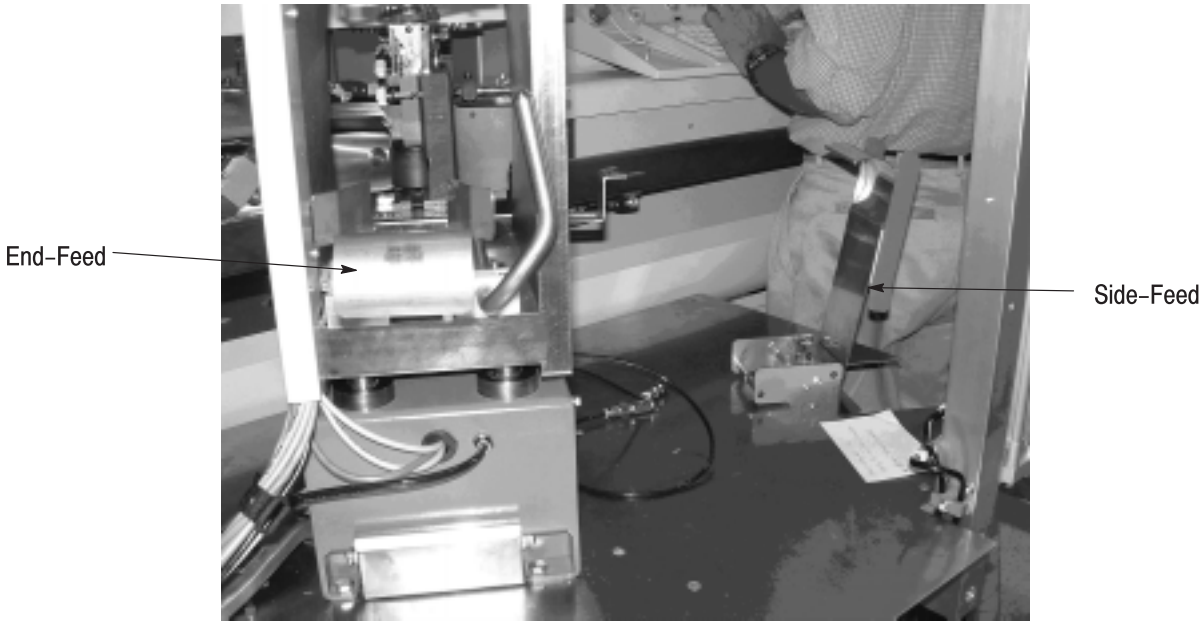
Figure 142

ST III Power Terminal Dereeler and Paper Winder Options

After the cables are routed and connected to the appropriate terminal deflectors and motors, the other ends must be connected to the ST III control panel. Refer to Figure 143.



ST III Control Panel (Lower Right)



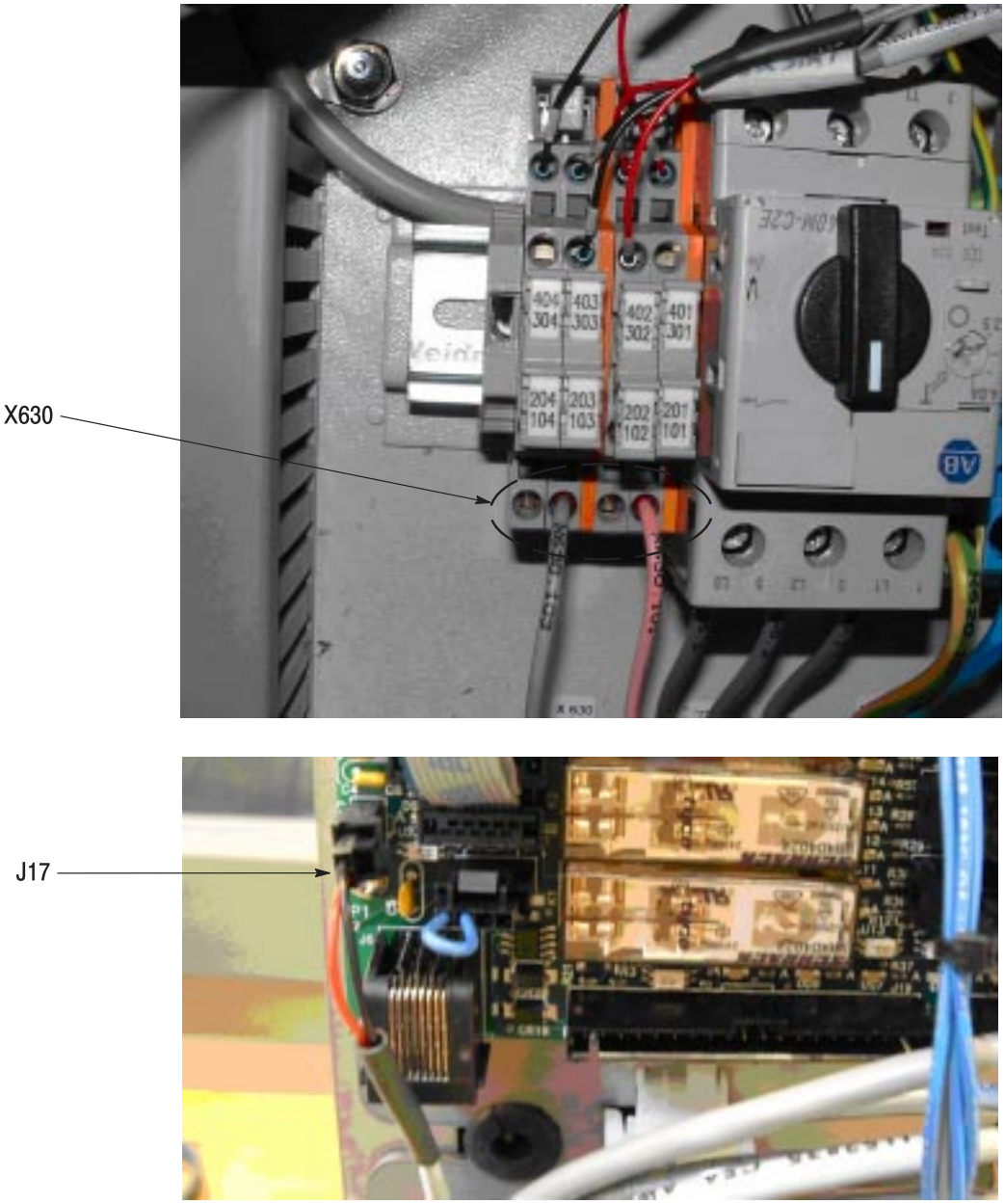
ST III Terminal Deflectors

Power Dereeler and Paper Winder Connection Table			
Power Dereeler 1752440-[x]	Side-Feed Terminal Deflector Inputs J26	End-Feed Terminal Deflector Inputs J18	Motor Connection J25
Winder 1752440-[x]	N/A	N/A	Motor Connection J24

Figure 143

ST III Switch 24 Volts DC Connection

Switched 24Vdc power in the AMPOMATOR System III control cabinet must be connected to J17 on the control panel with the switched 24 volt cable 1901643–1. Refer to Figure 144.



Switched 24 Volts DC Connection Table

Side–1, Station 1	Switched 24 Volt Cable 1901643–1	Control Panel J17	X630–302 Red Wire (+)
			X630–303 Black Wire (–)
Side–2	Switched 24 Volt Cable 1901643–1	Control Panel J17	X630–402 Red Wire (+)
			X630–403 Black Wire (–)
Side–1, Station 1.2 (433/L)	Switched 24 Volt Cable 1901643–1	Control Panel J17	X630–401 Red Wire (+)
			X630–404 Red Wire (–)

Figure 144

AMPOMATOR Machine System III Machine Power and Conveyor Wiring

The purpose of this section is to illustrate the various wiring configurations that are required for the eight voltage ranges. Refer to Sheet 6 of Schematic 1901676.

Figure 145 illustrates power entry.

Figure 145

Figure 146 illustrates power wiring into the Z1 line filter (L1, L2, L3, N, and PE).

Figure 146

See Figure 147 for ferrites on output Z1 line filter.

Figure 147

Figure 148 shows T1, the main power transformer.

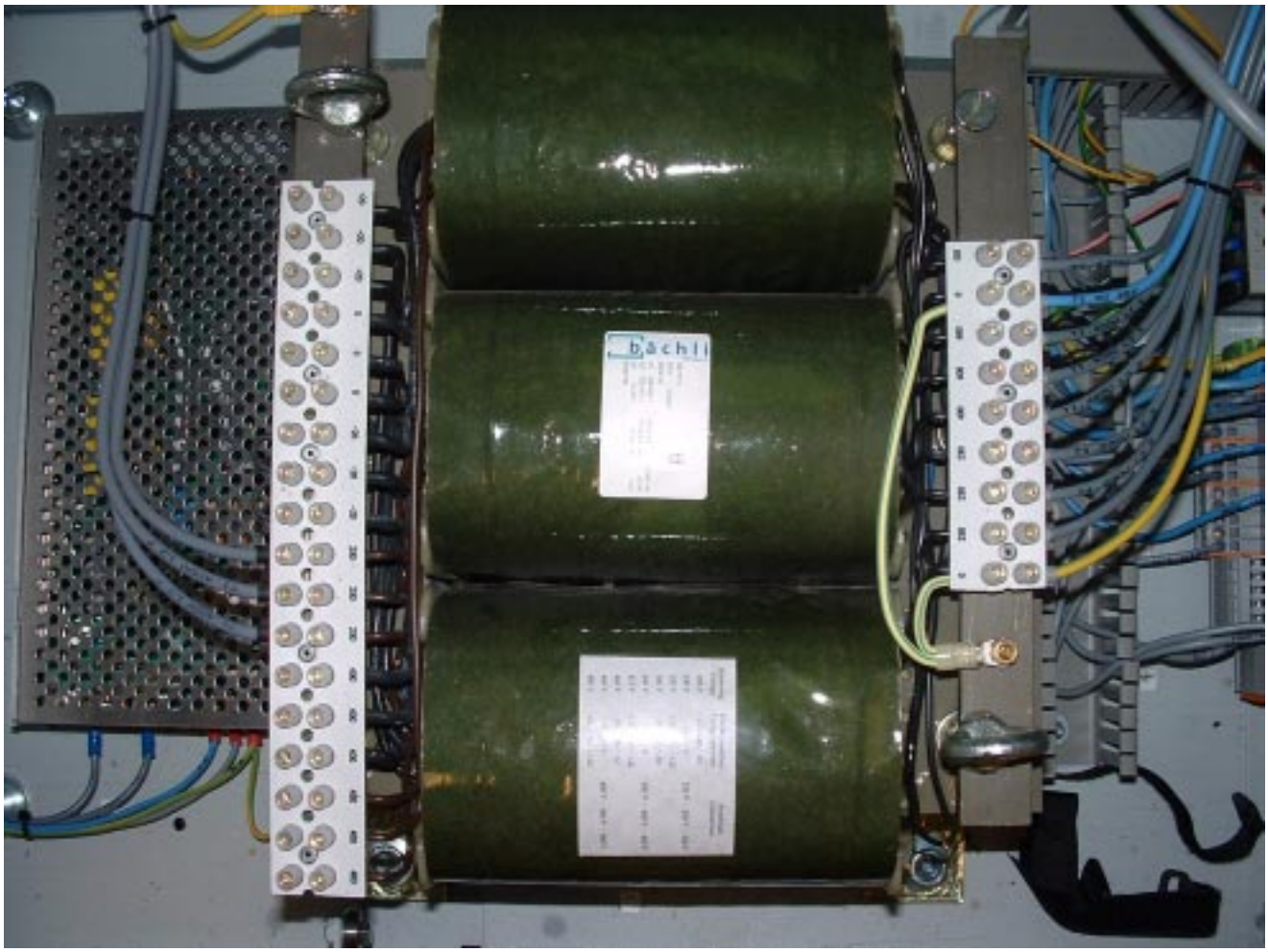


Figure 148

NOTE

The base machine is configured for 208V (210V per the table in Figure 150) from Komax. Identify the proper input voltage, located on the sticker on the side of the main electrical cabinet (Figure 149).

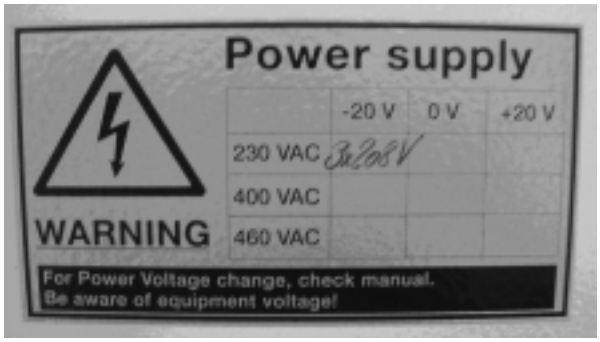


Figure 149

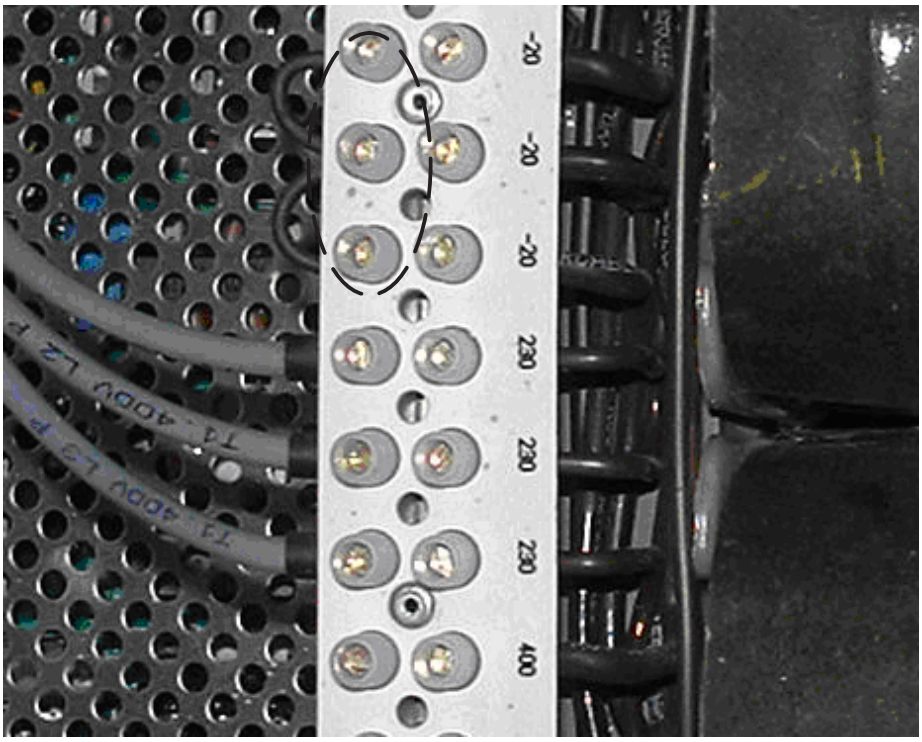
Input Voltage	T1 Primary Connection L1 L2 L3	T1 Jumper Connection	Conveyor (Base and Extension Motor Wiring)	Q5 Number and Current	Neutral Wire 1901721–1	T2 Kit 1752535–1	Q2 – 32A	Q3 – 16A	Extension Conveyor Switch
210	230 230 230	–20 –20 –20	Delta	7–547608–3 2.7A	No	No	Std	Std	510613–4 2.7A
230	230 230 230	0 0 0	Delta	7–547608–3 2.7A	No	No	Std	Std	510613–4 2.7A
380	400 400 4 00	–20 –20 –20	Y	7–547608–2 1.7A	Yes	No	Std	Std	547487–5 1.7A
400	400 400 4 00	0 0 0	Y	7–547608–2 1.7A	Yes	No	Std	Std	547487–5 1.7A
420	400 400 4 00	+20 +20 +20	Y	7–547608–2 1.7A	No	Yes	Std	Std	547487–5 1.7A
440	460 460 460	–20 –20 –20	Y	7–547608–2 1.7A	No	Yes	509923–2 (Komax –– 022973)	509977–1 (Komax –– 007218)	547487–5 1.7A
460	460 460 460	0 0 0	Y	7–547608–2 1.7A	No	Yes	509923–2 (Komax –– 022973)	509977–1 (Komax –– 007218)	547487–5 1.7A
480	460 460 460	+20 +20 +20	Y	7–547608–2 1.7A	No	Yes	509923–2 (Komax –– 022973)	509977–1 (Komax –– 007218)	547487–5 1.7A

Figure 150

If the input voltage must be changed from 208 (210), configure the T1 primary conns and the T1 jumper connections as indicated in the Main Power Connection Chart. See Figure 151.

NOTE

The T1 primary and jumper connections shown in Figure 151 are shown for an input voltage of 208V (210V).



Primary Wire Marking
T1 400V L1
T1 400V L2
T1 400V L2

Figure 151

Base Machine Conveyor Motor Wiring and Contactor Current Settings

Figure 152 shows the 210–230V Delta Motor Connection.

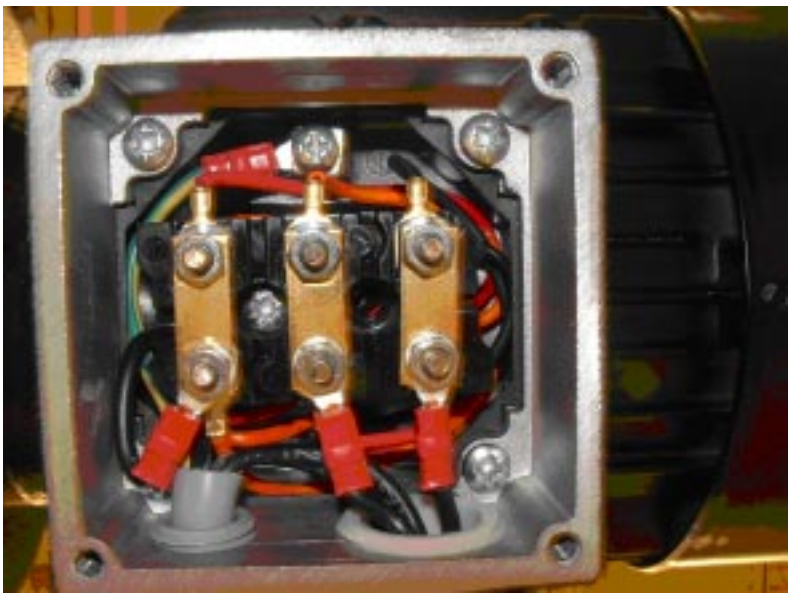


Figure 152

If the incoming voltage is 380–480V, the conveyor motor must be changed to the “Y” wiring configuration according to Figure 153.

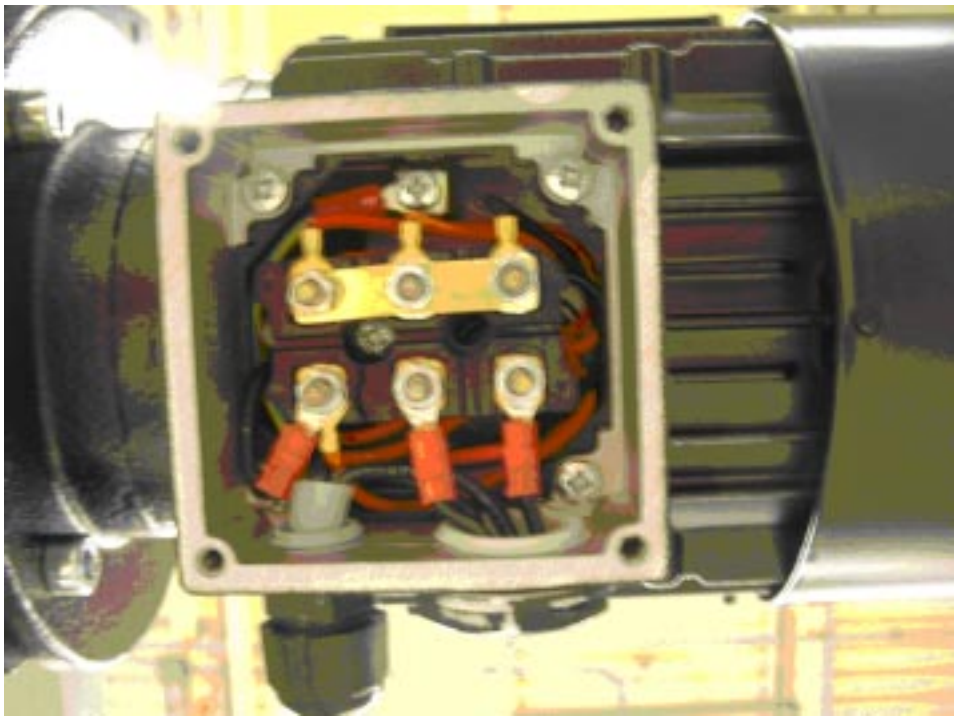


Figure 153

NOTE

There are three connection straps. On the “Y” configuration, use two straps for one of the connections for future changes.

If the incoming voltage is 380–480V, contactor Q5 must be replaced and will be included with the order.

Check the current setting on Q5.

- Figure 154 shows 210–230V, Q5, — 7–547608–3 — Current setting 2.7A
- Figure 155 shows 380–480V, Q5, — 7–547608–2 — Current setting 1.7A

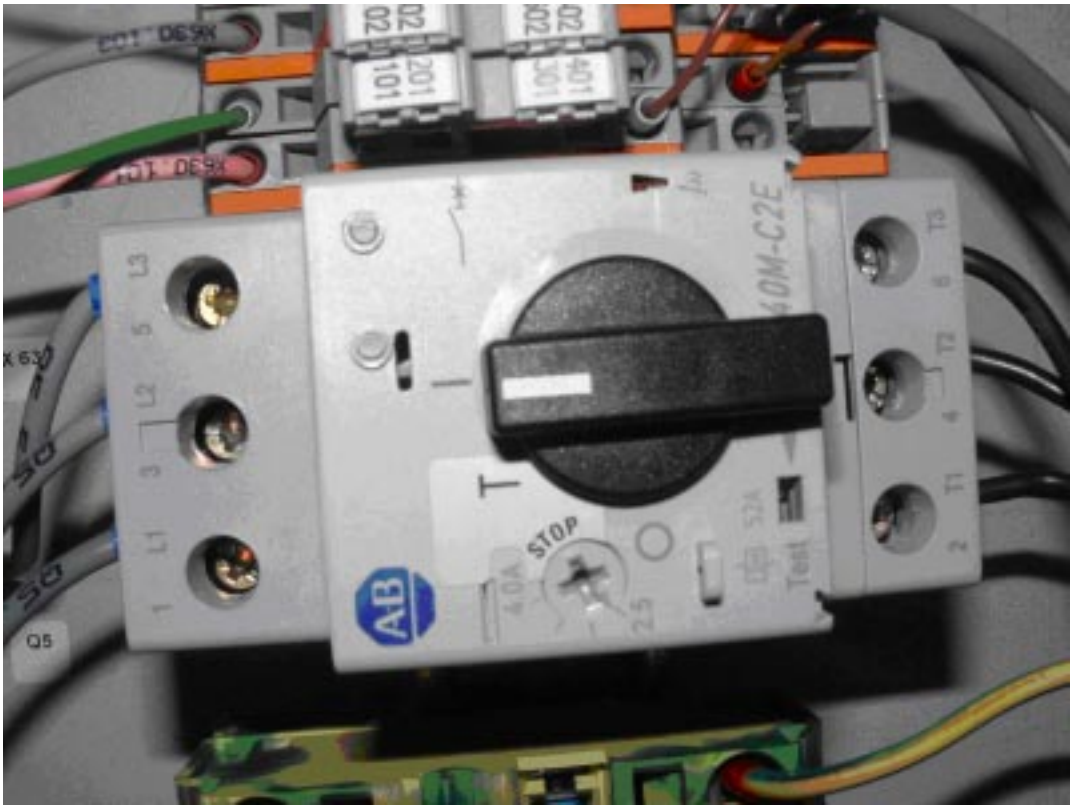


Figure 154

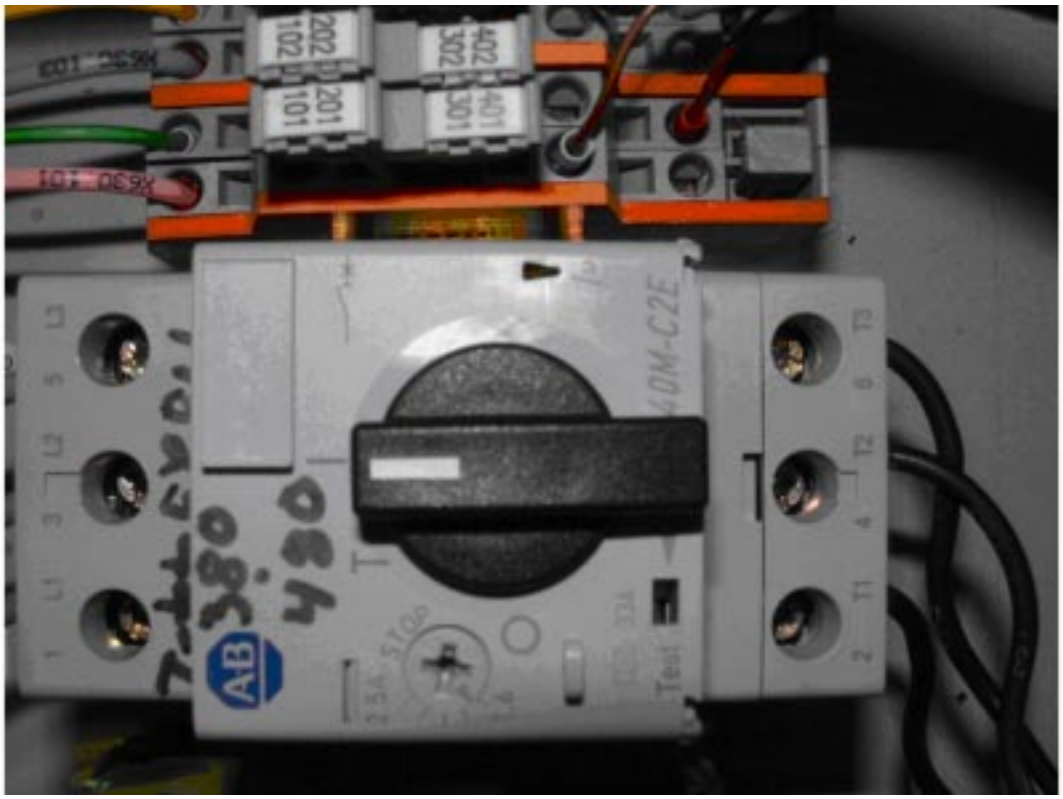


Figure 155

Optional Extension Conveyor Motor Wiring and Protection Switch Current Settings

If the incoming voltage is 380–480V, the extension motor must be changed to the “Y” wiring configuration, shown in Figure 153.

NOTE

There are three connection straps. On the “Y” configuration,use two straps for one of the connections for future change.

If the incoming voltage is 380–480V, the motor protection switch (Figure 156) on the extension conveyor must be replaced.

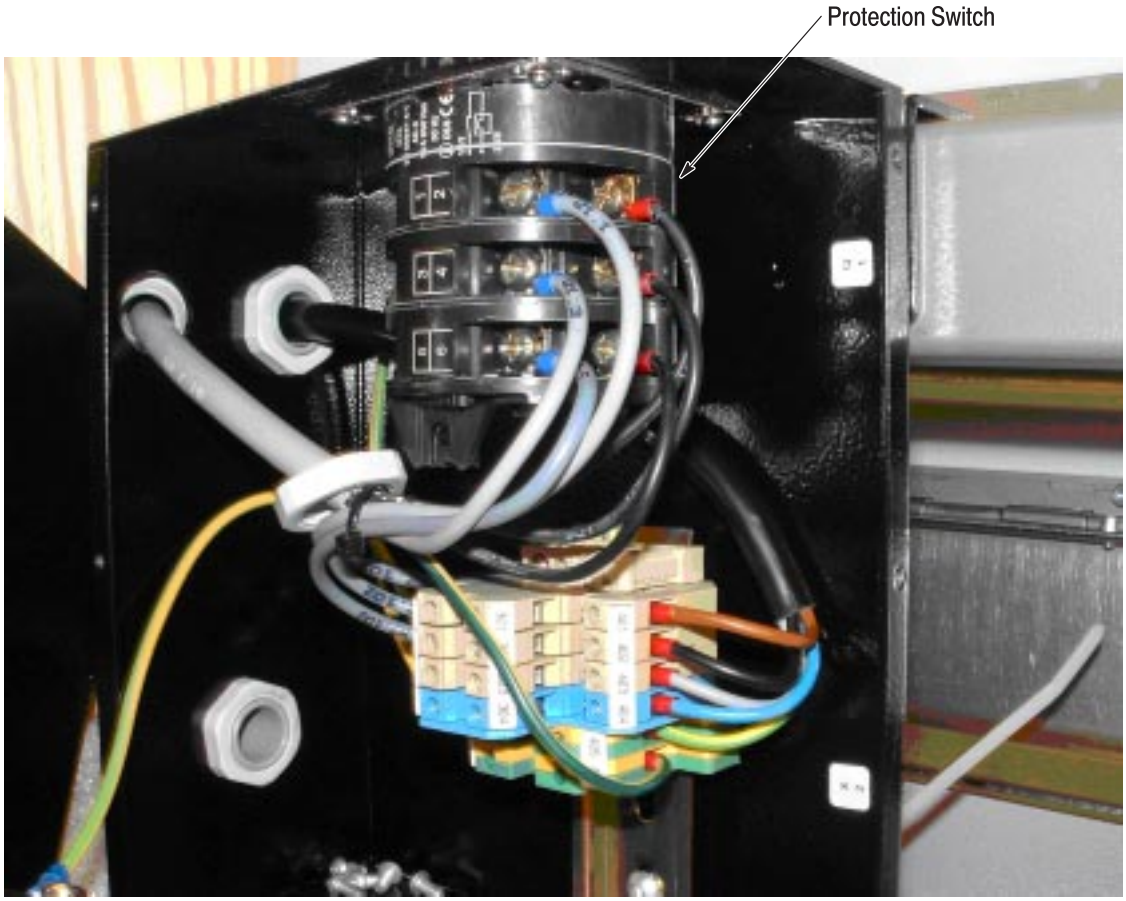


Figure 156

Check the current setting on the switch.

- Figure 157 shows 208–230V Extension Conveyor Motor Protection Switch 510613–4 — the current setting is 2.7A.
- Figure 158 shows 380–480V Extension Conveyor Motor Protection Switch 547487–5 — the current setting is 1.7A.

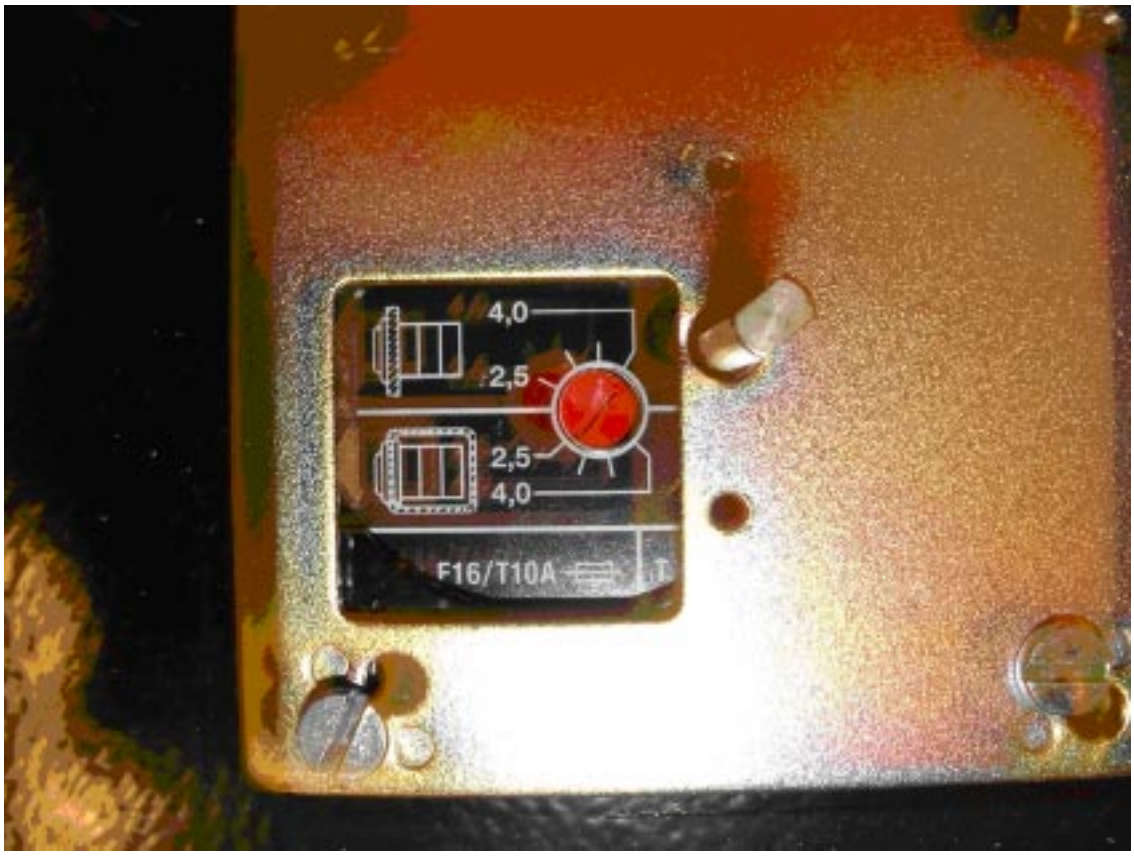


Figure 157

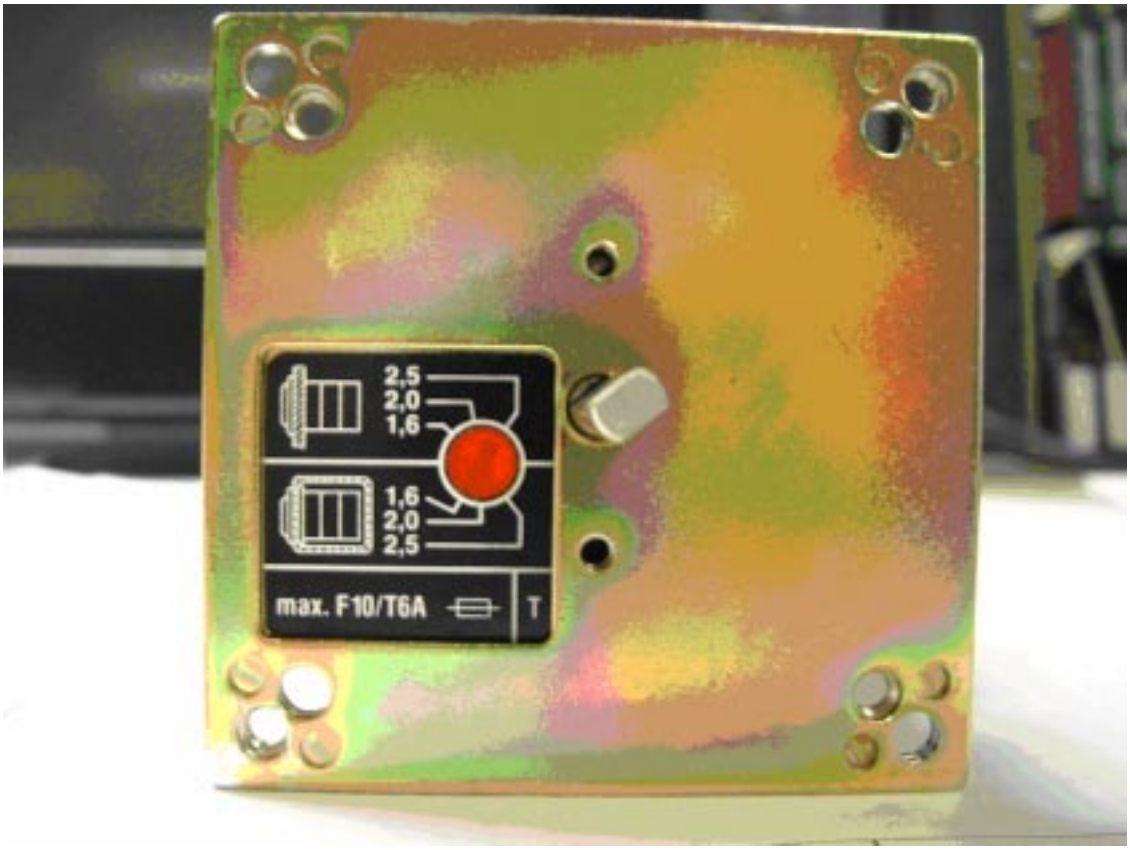


Figure 158

Input Voltages of 380V and 400V Require Neutral Wire 1901721–1

Remove blue wire X610–210. See Figure159.

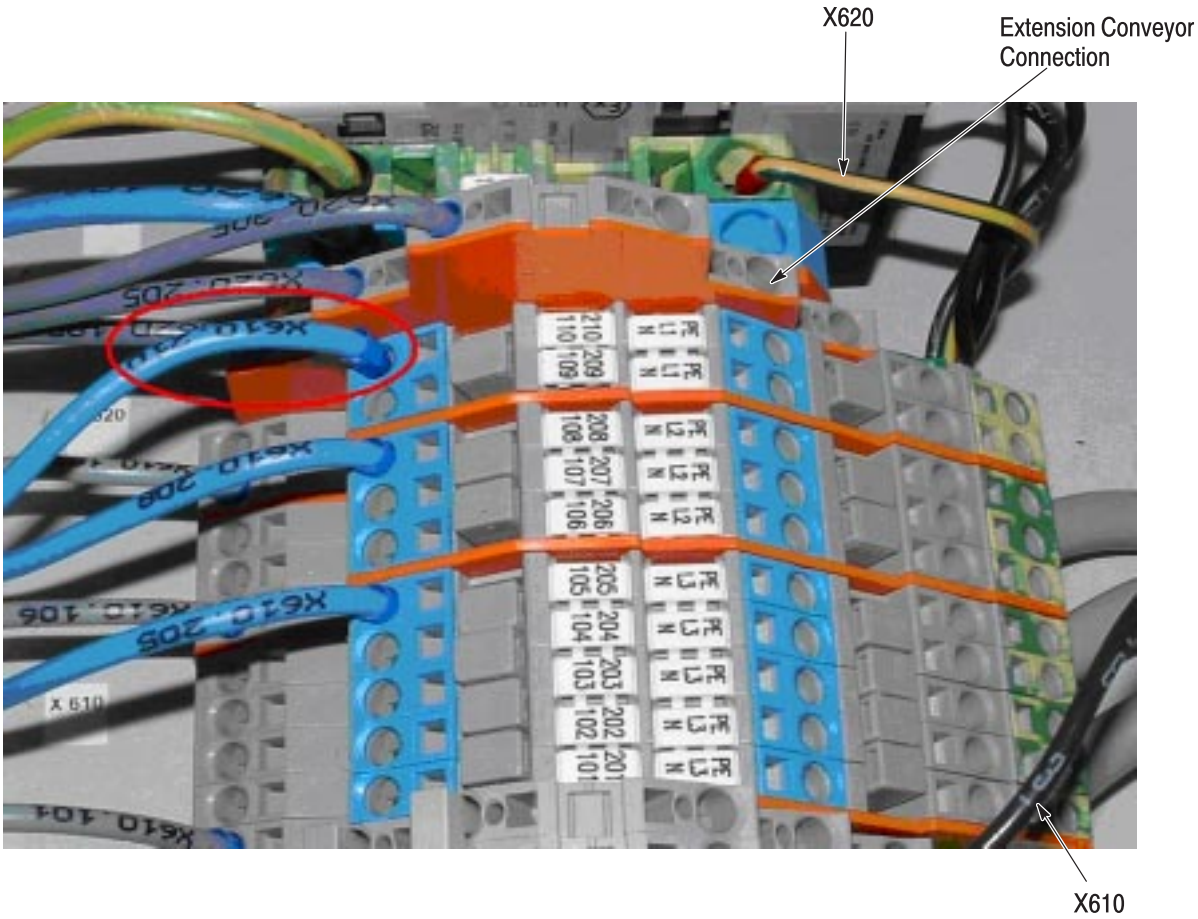
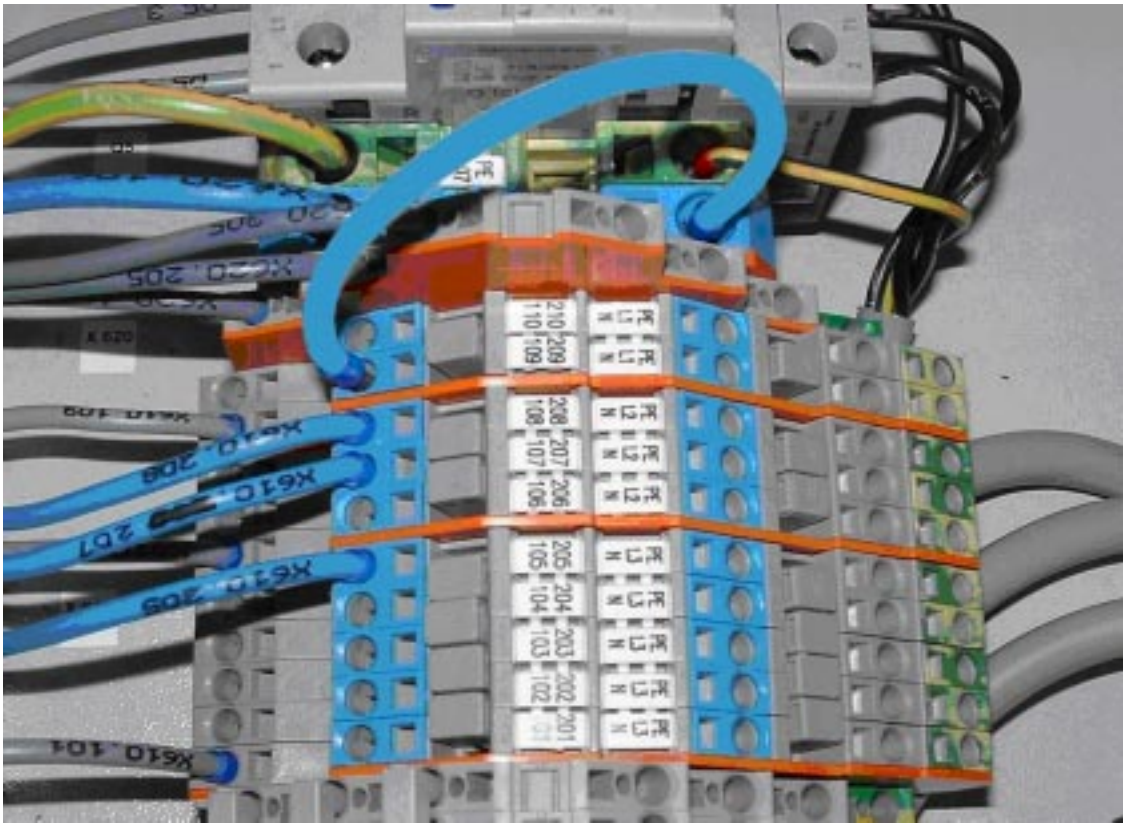


Figure 159

Install this wire into X610–207 and re–mark (with a marking pen similar to a Sharpie). Figure160 shows X610 and X620 with neutral wire and X610–207 moved and marked.



Neutral Wire	Part Number 1901721–1	X620–106	X610–209

Figure 160

Input voltages of 440V, 460V and 480V: Q2 and Q3 Replacement

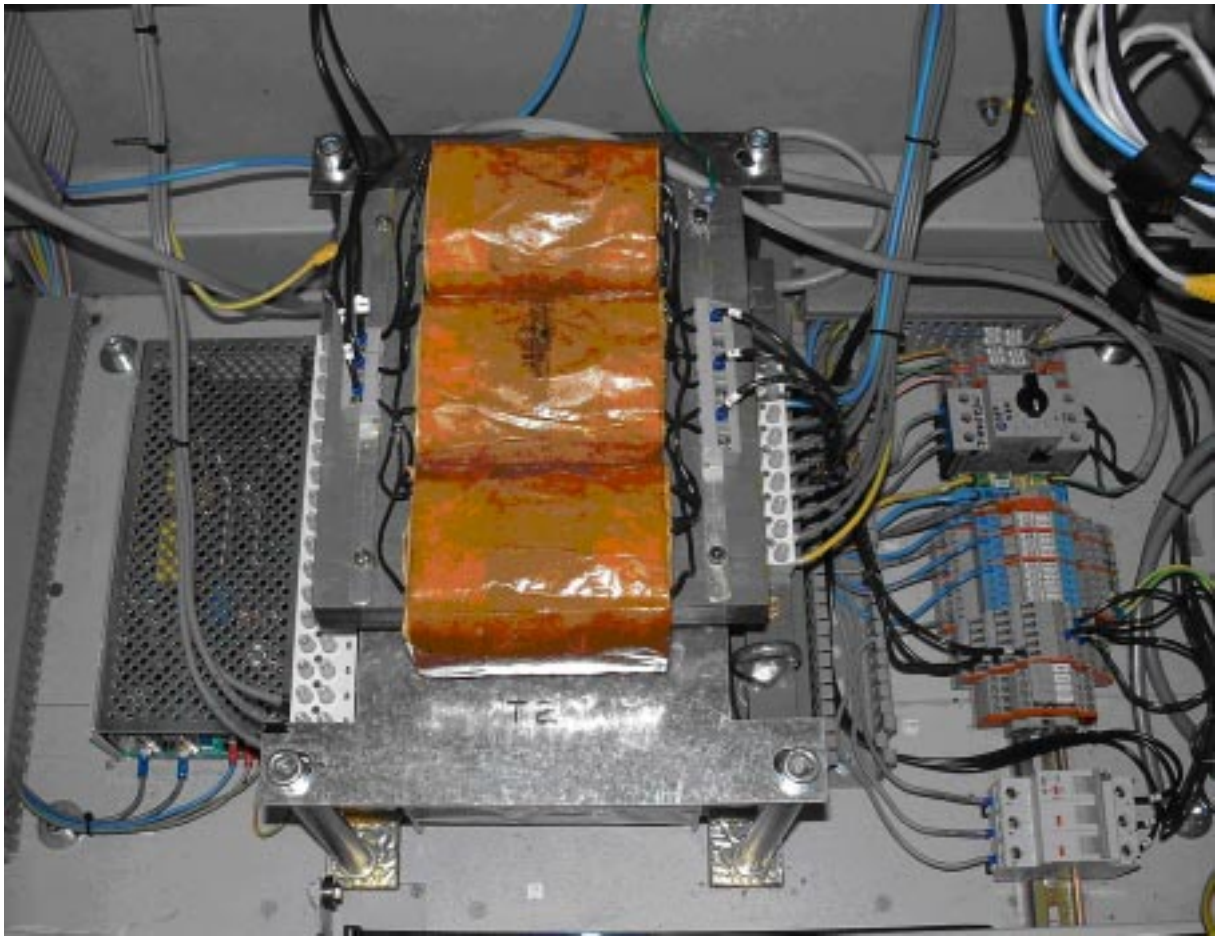
For input voltages of 440V, 460V, and 480V, the two circuit breakers Q2 and Q3 must be replaced. Refer to Figure 161 and Figure 162. Circuit breaker Q4 will have to be moved to the right approximately two inches for the replacement Q2 and Q3 breakers to fit on the DIN rail.

Figure 161

Figure 162

Input Voltages of 420V, 440V, 460V and 480V Require T2 Transformer Kit 1752535–1

After Transformer T2 and Circuit Breaker CB–1 are installed in the AMPOMATOR System III electrical cabinet they must be connected. Figure163 shows the Transformer T2 and CB–1 mounted in the cabinet.



Transformer Kit 1752535–1 (Shown Mounted)

Figure 163

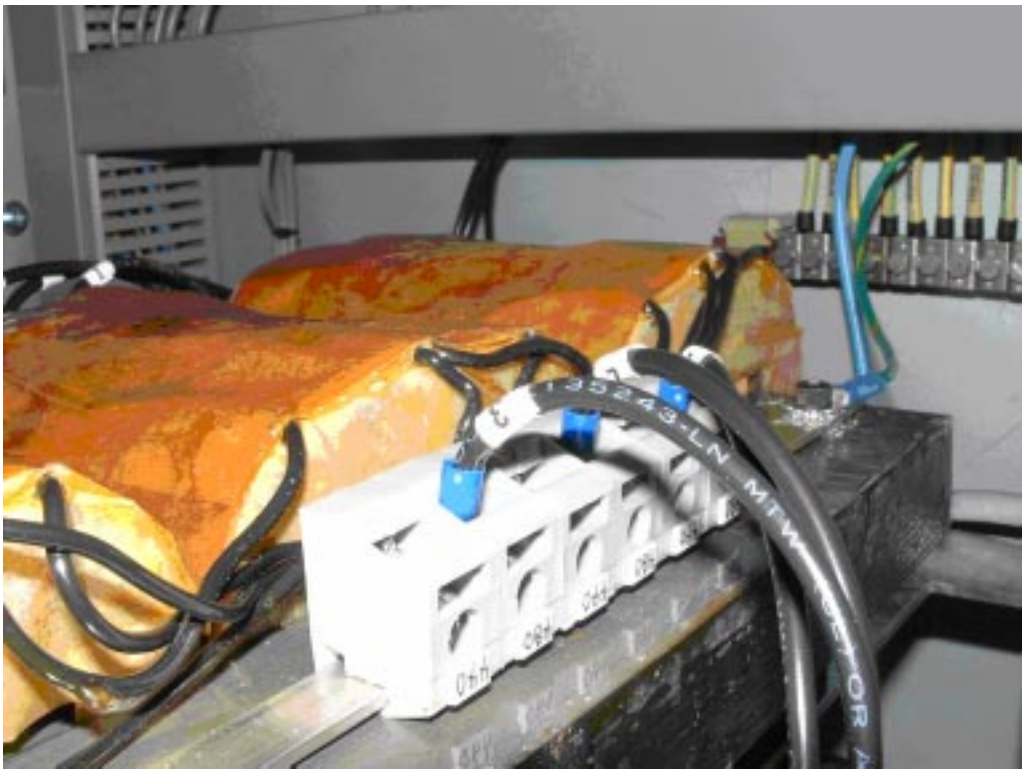
Wiring and Mounting for CB–1 Positions 2, 4, and 6		
Wire X600–101 to CB–1 Pos 2	Wire X600–201 to CB–1 Pos 4	Wire X600–301 to CB–1 Pos 6

Figure 164

The three wires L1, L2, and L3 must be disconnected from X600 and attached to Circuit Breaker CB–1. Refer to Figure 165.

NOTE

Do not confuse the T2 terminals. They are identified as 440 and 480 and are not based on actual incoming voltage. Each input phase has two *inputs: one labeled 440; and one labeled 480.*



T2 Primary Wiring Table			
Input Voltage	Wire L1-P from CB-1 Pos 1 to T2 Terminal	Wire L2-P from CB-1 Pos 3 to T2 Terminal	Wire L3-P from CB-1 Pos 5 to T2 Terminal
420	440	440	440
440	440	440	440
460	480	480	480
480	480	480	480

Figure 165

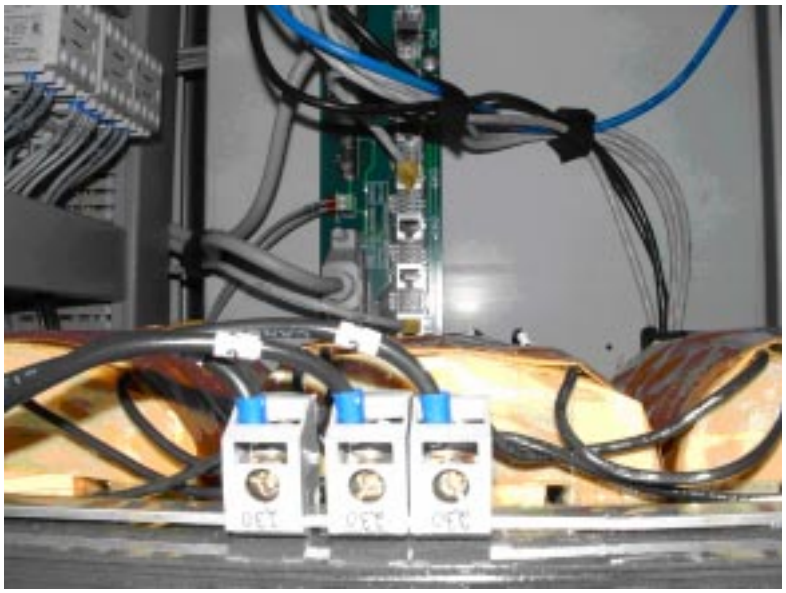


Figure 166 — T2 Secondary Terminals

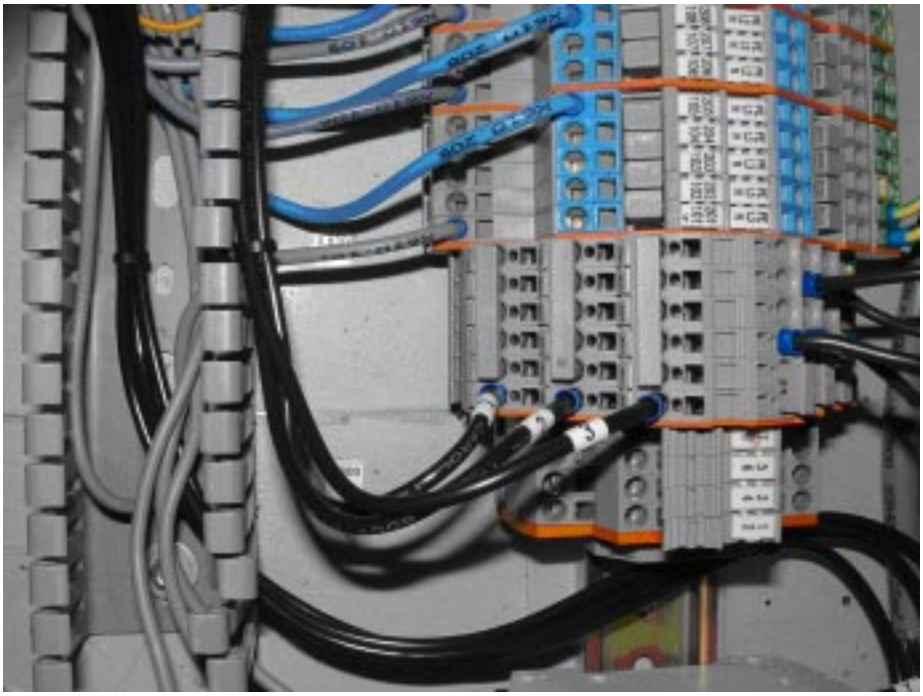


Figure 167 — New Wiring at X600

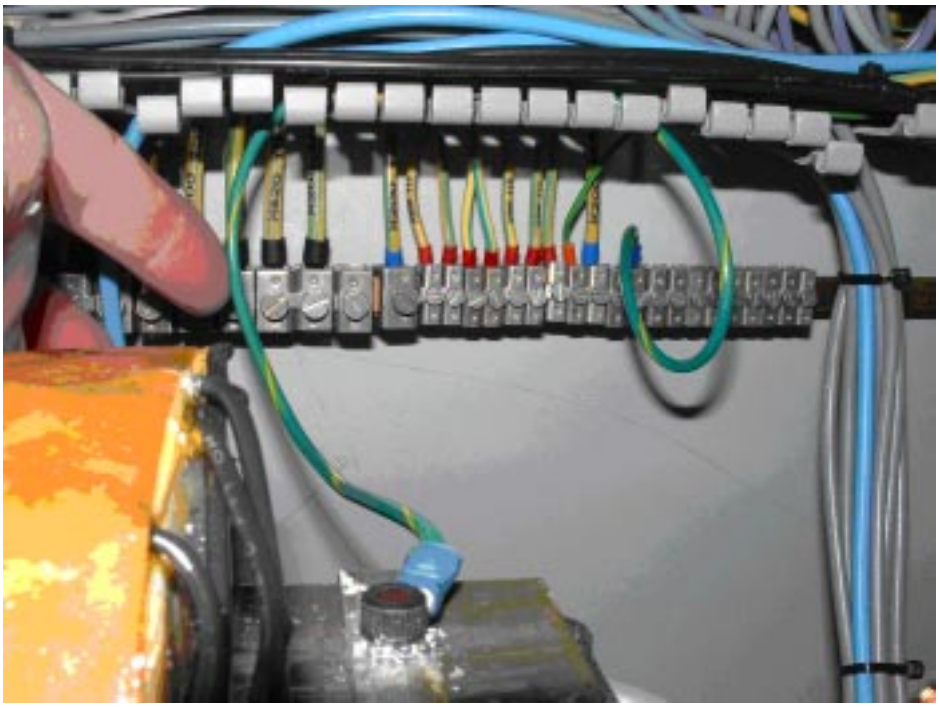


Figure 168 — Green/Yellow Ground Wire Connection

8. REVISION SUMMARY

- Revised Paragraph 6.9, Removing and Replacing the Electrical Panel Assembly
- Added Fine–Adjust System III Applicator