

Figure 1



## 1. INTRODUCTION

The HV Modular Die Holder with Fine Adjust (PN 2305470-1 or -2) is a product line that provides the customer with a versatile platform where multiple, modular die sets can be used to crimp multiple, high voltage terminals. This die holder is designed to be used with a high force terminator (max force of 178kN [20 ton]) that has a stroke of 44mm to 50mm and a shut height of 158.40mm, like the HF-20 Terminator (PN 2335500-X) or the HV-20 Terminator (PN 2348822-X).

Only HV-20 Terminator 2348822-[ ] Revision D and higher is equipped with a pneumatic assembly and controls to allow the use of the automatic cable clamp of the HV Modular Die Holder 2305470-2. It will not work on the HF-20 Terminator 2335500-[ ] or the HV-20 Terminator 2348822-[ ] Revision C and earlier.

When reading this instruction sheet, pay attention to DANGER, CAUTION, and NOTE statements:



**DANGER**

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



**CAUTION**

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



**NOTE**

*Highlights special or important information.*

## 2. GENERAL SAFETY INSTRUCTIONS

As with any product incorporating moving parts, be aware of all pinch points. Observe all safety labels displayed on the Terminator, in addition to safety standards set by your organization and the industry.



**DANGER**

*The HV Modular Die Holder functions by transferring a force of up to 178kN [20 tons] from a power unit (terminator) to a crimp interface, which can cause dramatic damage and/or dismemberment. Be sure all protective safety devices (interlocks) and guarding are in place and working.*

### 3. KEY FEATURES

The HV Modular Die Holder can accommodate various crimp dies and wire sizes/orientations.

#### 3.1. Interchangeable Dies

HV Modular Die Holder provides the option to exchange crimp dies to add versatility to the Die Holder.



**CAUTION**

*Before performing any work on the Die Holder, verify that the terminator is disconnected from its power source.*

1. Removing Dies

Unscrew the set screws identified in Figure 2 and remove the dies from the Die Holder. **MAKE SURE** the tools being used to remove the dies **DO NOT** contact the crimp surfaces.

2. Installing Dies

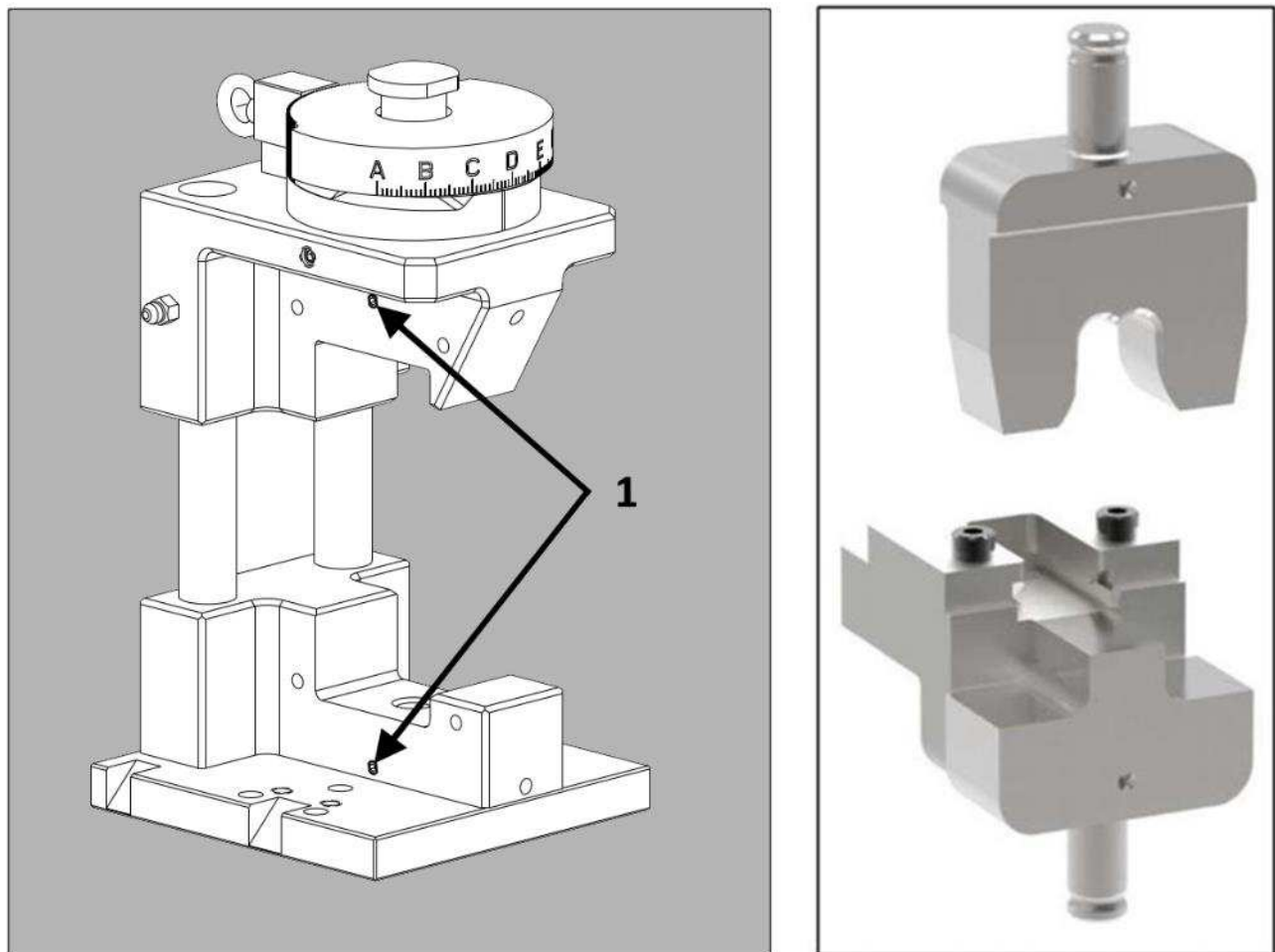
Refer to die Instruction Sheet for proper orientation, and place dies into the Die Holder accordingly. Secure the dies in the Die Holder by tightening the set screws shown in Figure 2.



**NOTE**

*There are 2 pairs of set screws (1 on each side of the Die Holder to ensure accessibility depending on which side the wire clamp is located). **Fastening 1 pair is sufficient to secure the dies.***

Figure 2



**1** Typical Set Screw Location  
(Only 1 Side Shown)

### 3.2. Wire Clamp

#### A. Manual Wire Clamp

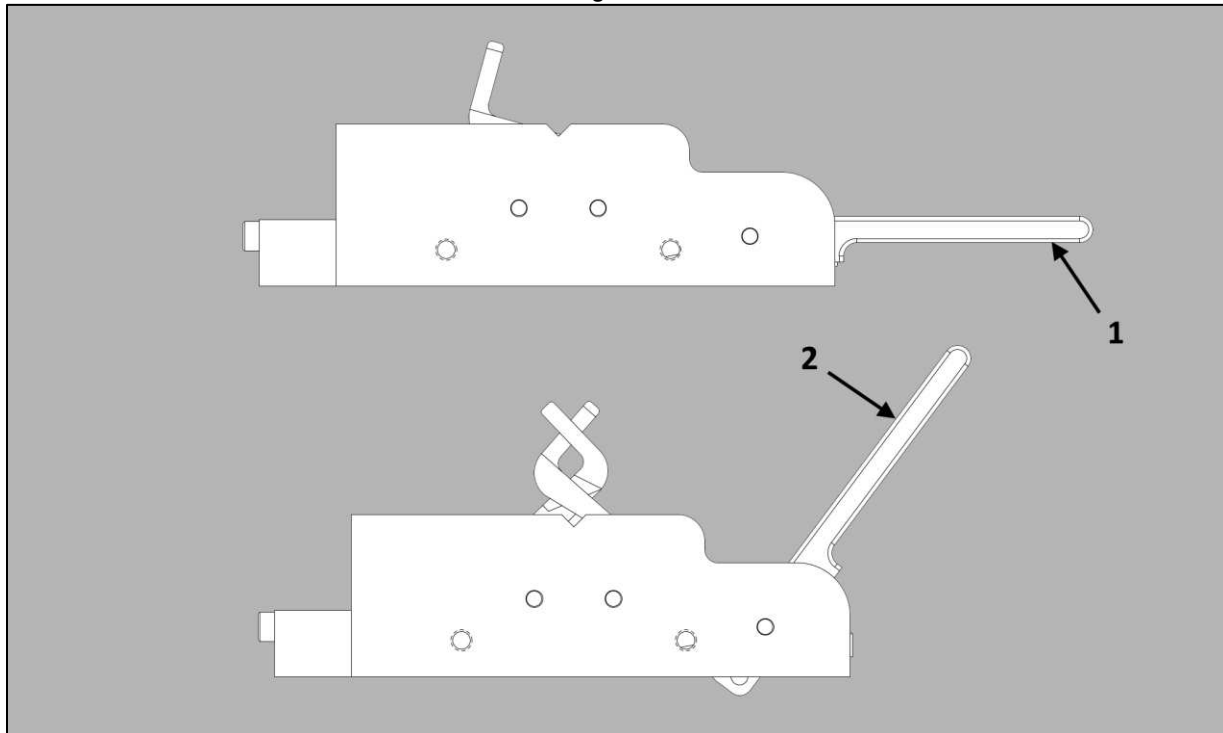
1. The HV Die Holder provides locations to mount a Wire Clamp on either side of the Die Holder (see Figure 4). This allows for versatility in crimping orientations and a wider range of crimping options. The Wire Clamp is likewise, designed to be used on either side of the Die Holder.



**NOTE**

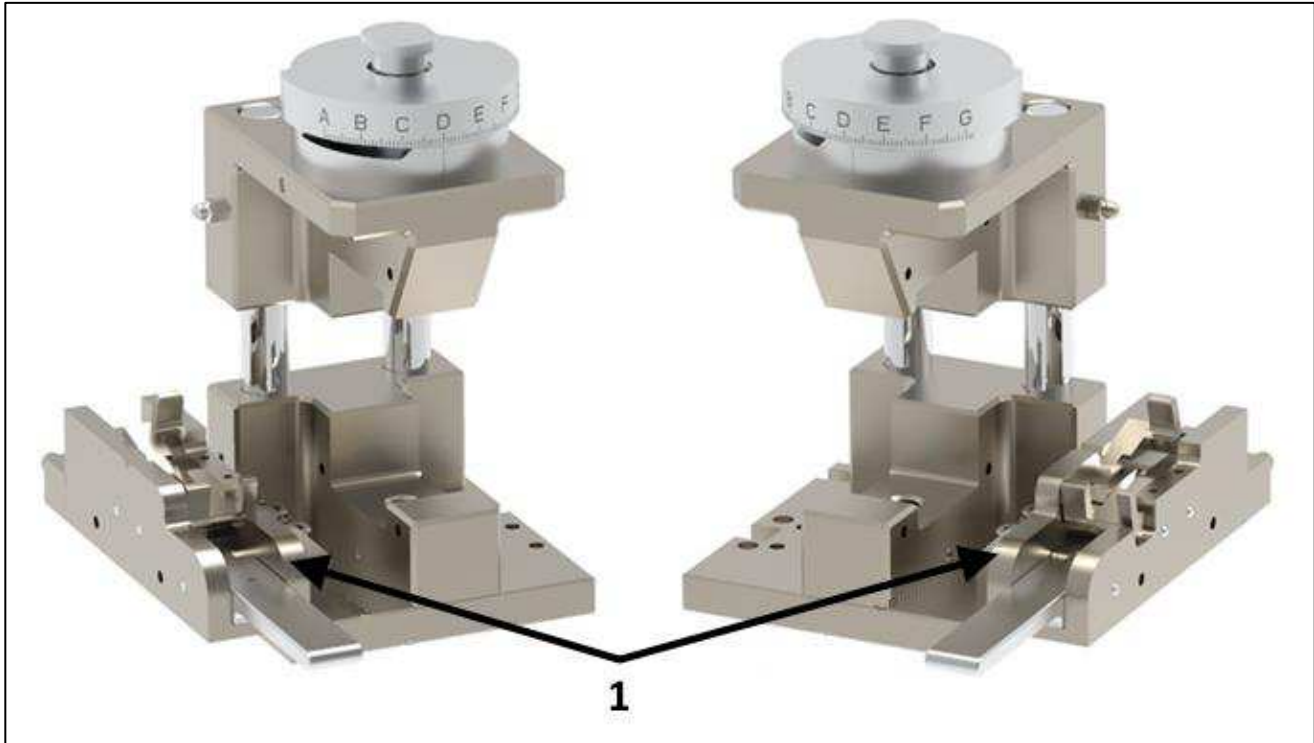
*A Wire Clamp is a spring-operated mechanism that holds a wire in a fixed position while the crimping operation is taking place. To close the grip jaws around the cable, lift up on the handle. To open the grip jaws, push down fully on the handle. The mechanism will hold the handle down and the jaws open. (reference Figure 3).*

Figure 3



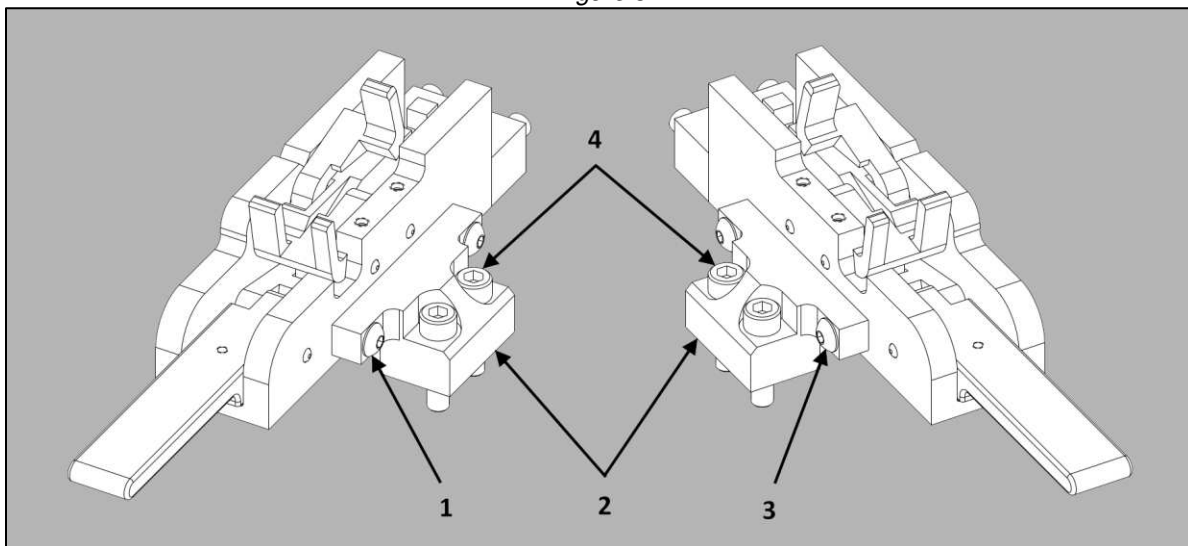
- 1** Lift to close jaws
- 2** Push to open jaws

Figure 4


**1** Wire Clamp Mounting Options

To change the location of the Wire Clamp, unfasten the (2) M6 screws shown in Figure 5. Remove the (2) M5 Mounting Screws holding the Mounting Bracket to the Wire Clamp (See Figure 5). Move the mounting bracket to the opposite side of the Wire Clamp. Install in the (2) M5 Mounting Screws. Attach the Wire Clamp to the HV Die Holder using the (2) M6 screws.

Figure 5

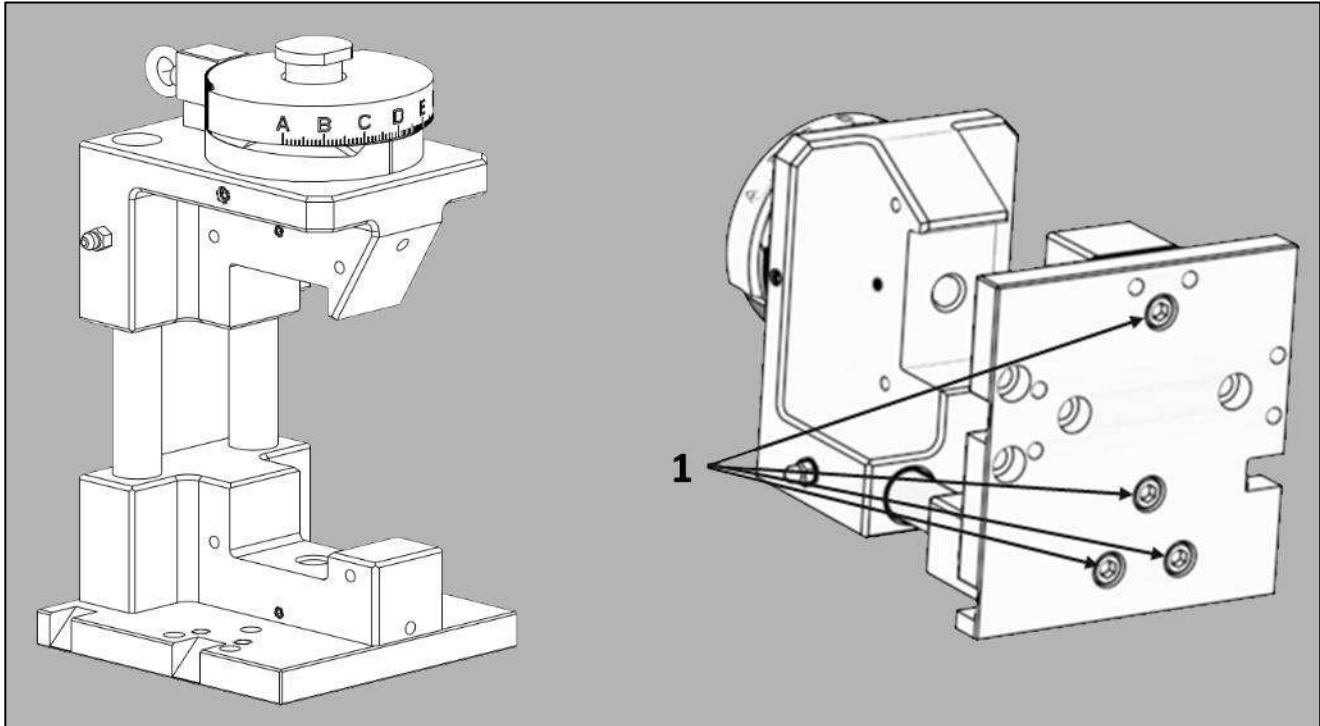


- 1** M5 Mounting Screws
- 2** Mounting Bracket
- 3** Mounting Screws
- 4** M6 Mounting Screws

2. The HV Modular Die Holder can be reconfigured to introduce the wire from the front of the machine.
  - a. Remove the wire clamp from the assembly (see Figure 6A) as described above.
  - b. Remove the (4) M6 screws (see Figure 6B) from the base plate.

Figure 6A

Figure 6B



1 (4) M6 Screws

- c. Rotate the lower toolholder 90 degrees (see Figure 7A) and reinstall the M6 screws removed from the Base Plate (See Figure 7B.)



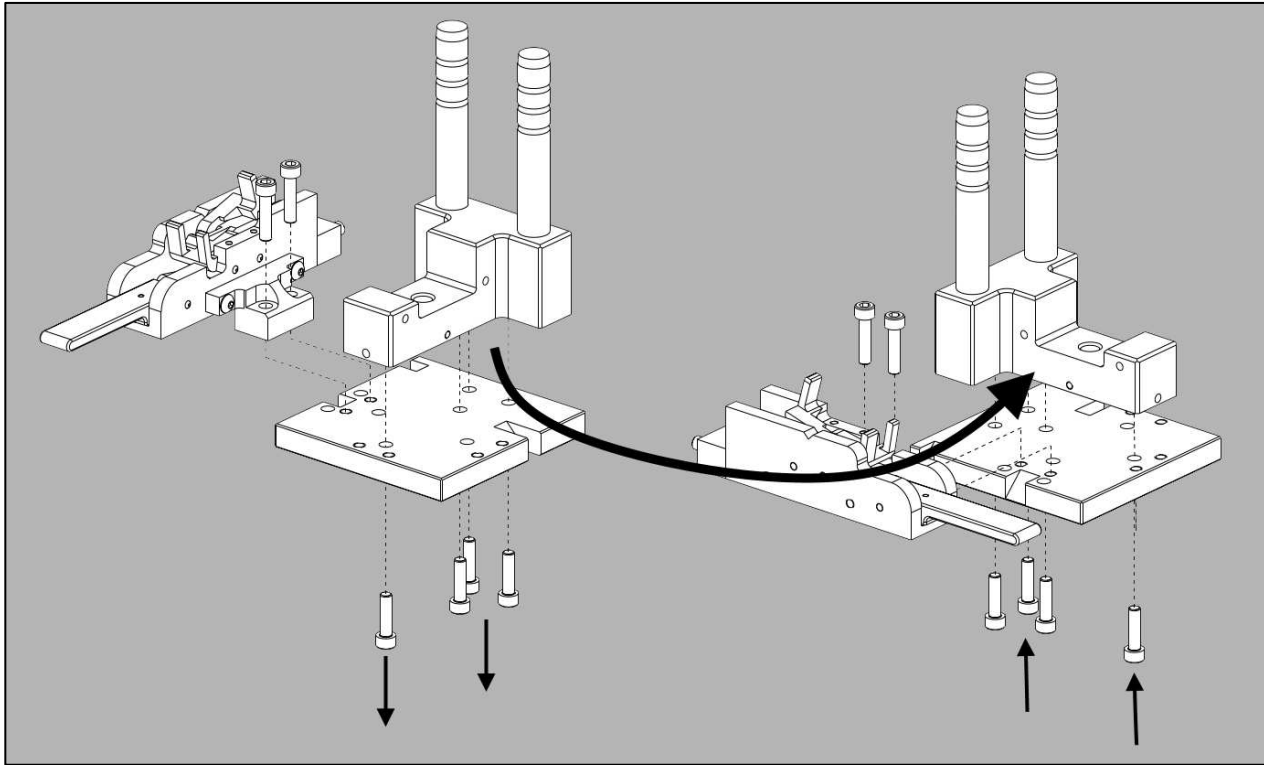
**NOTE**

Torque the M6 screws to 120 in/lbs (13.5 Nm) to insure proper assembly.

- d. Reinstall the wire clamp assembly in the location shown in Figure 7B.

Figure 7A

Figure 7B



**B. Automatic Cable Clamp**

1. Installation:

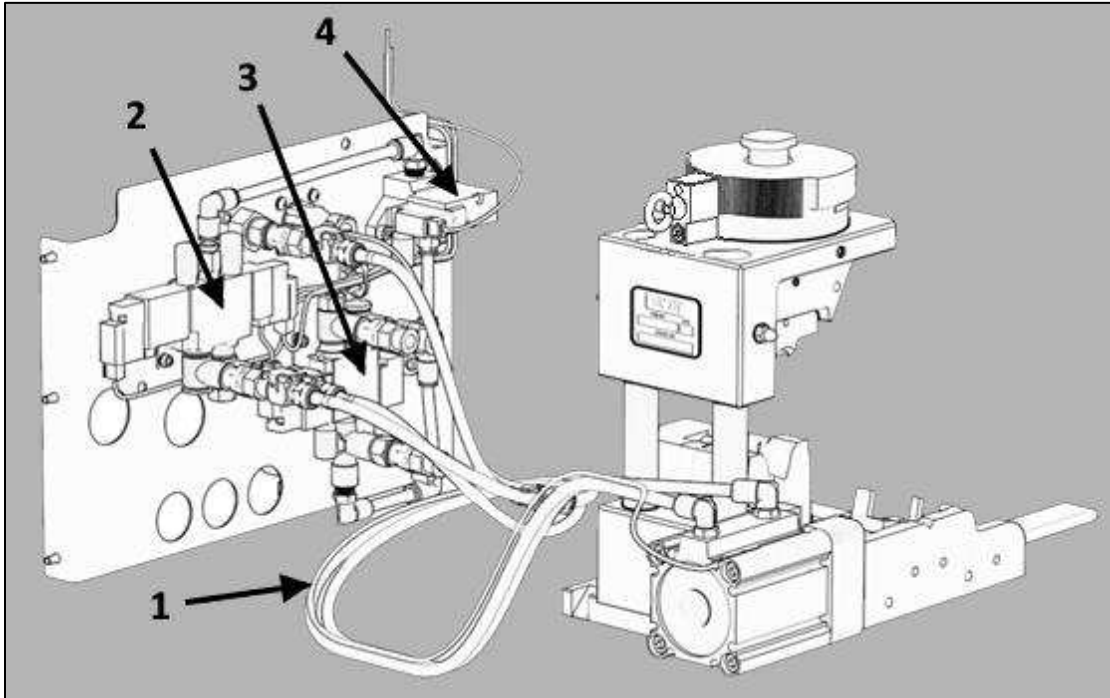
- a. Mount the Die Holder with the Automatic Cable Clamp on the baseplate of the terminator.
- b. Route the air lines to the rear of the machine. Make a loop of the extra length of air line and secure so that it does not interfere with the die holder operation. (See Figure 8).



**NOTE**

Figure 8 shows the cable clamp mounted on the front mounting location. With the clamp mounted on the side mounting location, route the air lines similar to the routing shown in Figure 8.

Figure 8



- 1** Route Air Lines Similar to Figure
- 2** Clamp Valve
- 3** Air Feed/Vacuum Valve
- 4** Main Valve

\* Terminator Frame and Guards Not Shown in Figure 8 for Clarity.

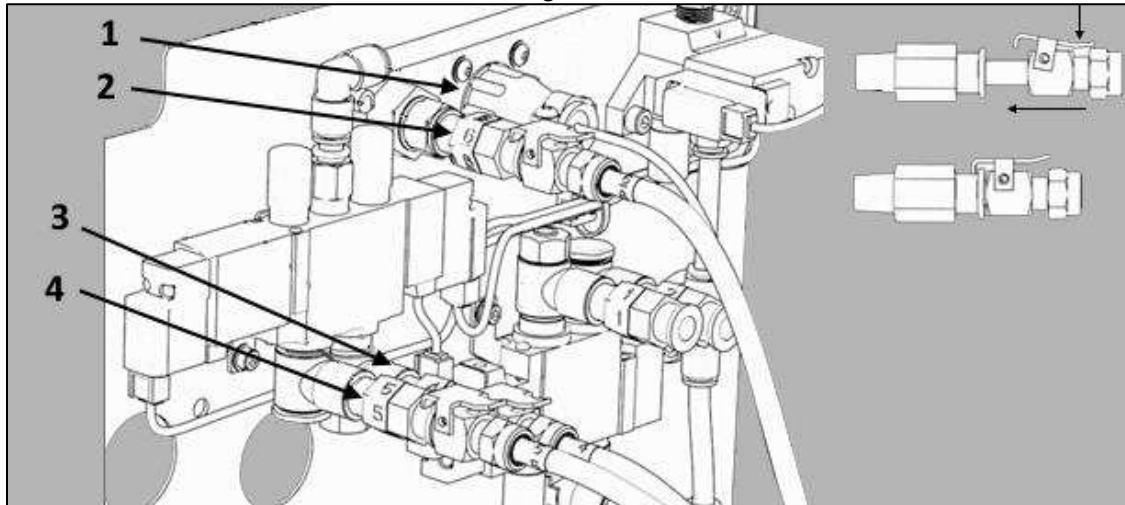
- c. Attach the CPC connector as shown in Figure 9
- d. Attach the three air lines to their respective ports as listed below (see Figure 9)
  - (1) Air cylinder retract air line 4 to Port 4 of clamp valve (port with flow control)
  - (2) Air cylinder extend air line 5 to Port 5 of clamp valve (port with no flow control)
  - (3) Air cylinder extend air line 6 to Port 6 of pressure switch



**NOTE**

*Flow control of Port 4 should be adjusted using a small flat head screwdriver so that the handle moves down to open the jaws without slamming into the cable clamp housing. Turn the flow control in (clockwise from screwdriver entry point) to slow down the handle movement.*

Figure 9



- 1 CPU
- 2 Port 6
- 3 Port 4
- 4 Port 5

2. Operation:

a. To load the cable:

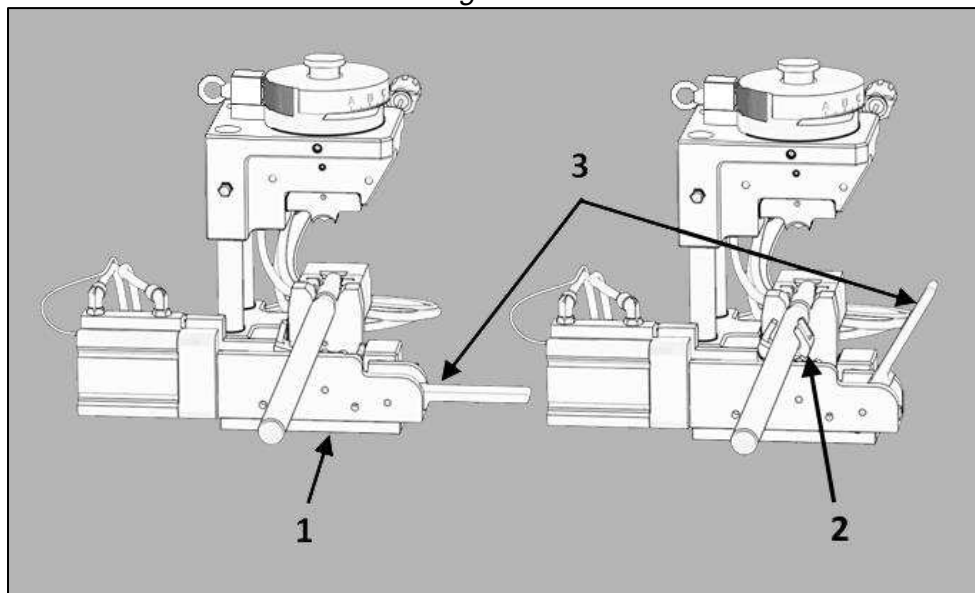
- (1.) Position the cable in the die holder.
- (2.) Lift up on the handle and springs will close the jaws (see Figure 10).



**NOTE**

The jaws only help locate the cable. They do not lock the cable in place before and during crimping. They allow the cable to slide in the jaws due to terminal extrusion during crimping. The cable should be supported external of the terminator to prevent movement before termination.

Figure 10



- 1 Automatic Cable Clamp
- 2 Jaws Clamped on Cable
- 3 Handle

b. To unload the cable:



**NOTE**

The set-up person can select between manual unload operation and automatic unload operation from the Terminator Set-up screen when selecting to use the automatic cable clamp.

- (1.) Option 1, Manual jaw opening operation:
    - (a.) Push down fully on the handle to open the jaws.
    - (b.) The jaws will remain open.
    - (c.) Remove the cable.
  - (2.) Option 2, Automatic jaw opening operation:
    - (a.) The jaws will automatically open after a good crimp or after a defective crimp is acknowledged.
    - (b.) Raise the guards.
    - (c.) The operator can then remove the cable.
- c. Operation with the Crimp Quality Monitor (CQM) and automatic cable clamp:

**NOTE**

For the automatic cable clamp to work, Crimp Quality Monitoring and the automatic cable clamp must be selected by the set-up person on the Terminator Set-up screen prior to termination.

- (1) The operator will load a terminal into the die holder.
- (2) The operator will load a wire or cable into the die holder and close the clamp jaws by lifting up on the handle.

**NOTE**

The jaws only help locate the cable. They do not lock the cable in place before and during crimping. They allow the cable to slide in the jaws due to terminal extrusion during crimping. Cable should be supported outside of the guarding to prevent cable movement before termination.

- (3) Operator will press the guard control pushbutton to close the guard.
- (4) Operator will press the footswitch to start a terminator cycle and crimp the terminal.
- (5) The Crimp Quality Monitor (CQM) will analyze the crimp.
- (6) If the crimp is determined to be good:
  - The operator will open the upper guard by pushing the guard control push button.
  - If manual jaw opening operation was selected, the operator will open the jaws by pressing down fully on the handle.
  - If automatic jaw opening operation was selected, the jaws will open automatically before the guard opens.
  - The operator will remove the terminated cable.
- (7) If the crimp is determined to be defective:
  - Air pressure will be supplied to the grip jaws to apply additional force. This will make it difficult for the operator to remove the cable from the jaws. The guards will not open and an error message will display on the Terminator touch screen.
  - A supervisor or other authorized person must enter a code on the Terminator touch screen to clear the error message and continue operation.
  - The operator will open the upper guard by pushing the guard control push button.
  - If manual jaw opening operation was selected, the operator will open the jaws by pressing down fully on the handle.
  - If automatic jaw opening operation was selected, the jaws will open automatically before the guard opens.
  - The operator will remove the defectively terminated cable.

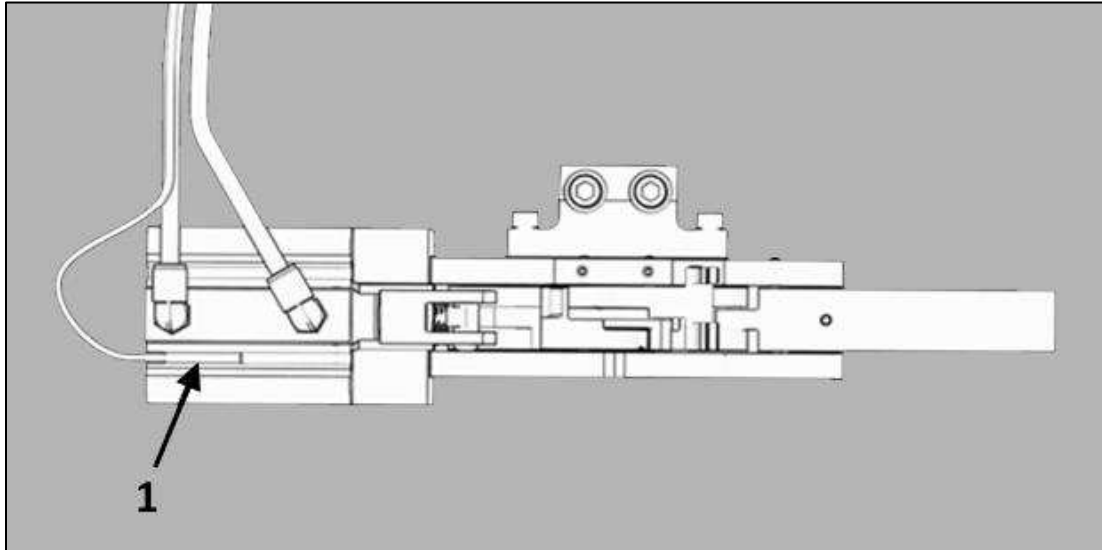
**NOTE**

The cable should be inspected by a qualified person to determine if the cable needs to be reworked or scrapped.

3. Adjustment:

The air cylinder retract sensor light should illuminate when the CPC is plugged in and the air cylinder is retracted and slightly extended to hold the handle in the down position. If adjustment is required, use a small flat head screwdriver to loosen the screw on the sensor. Adjust the sensor as needed until the light on the sensor is illuminated when the air cylinder is retracted and also when slightly extended to hold the handle down. See Figure 11).

Figure 11



1 Sensor

**3.3. Grease Port**

The moving parts of the machine require regular lubrication to ensure reliable service and long life.

1. Preferred greases are:

Chevron Ultra-Duty EP NLGI 2, Chevron Ulti-Plex EP NLGI 2, and Caltex Ultra-Duty EP NLGI 2.



**NOTE**

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



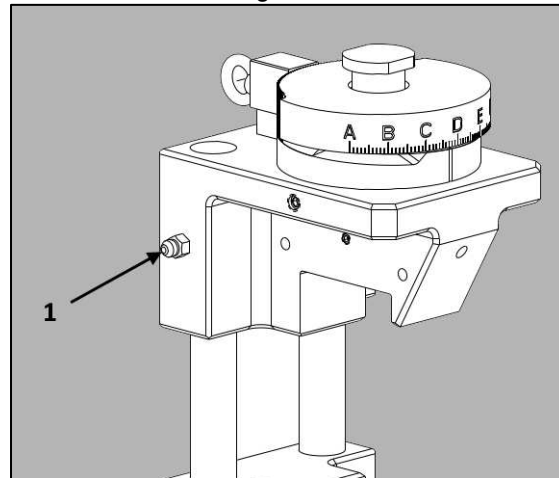
**NOTE**

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

2. Recommended Greasing Schedule:

Every 50,000 cycles, one pump of grease should be applied (via a grease gun) to each location indicated in Figure 12.

Figure 12



**1** Typical Grease Port Location  
(Only 1 Side Shown)

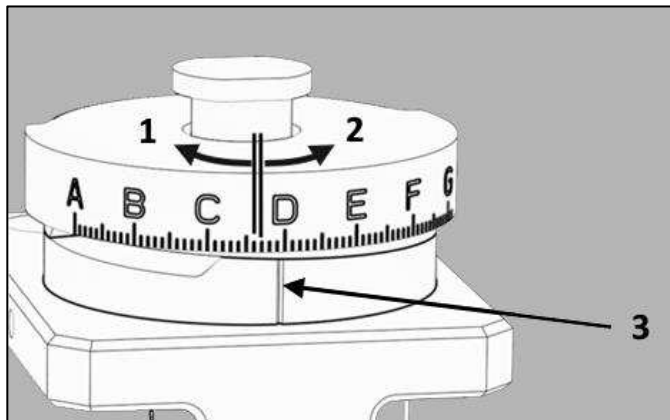
### 3.4. Crimp Height (Fine Adjust) Adjustment

The crimp height of the Die Holder can be adjusted using the crimp height adjustment feature located on top of the Die Holder. Each increment on the Height Position Head corresponds to 0.044 mm. Pull out the eye nut first and turning the Crimp Height Disc clockwise will decrease the crimp height; counterclockwise will increase the crimp height. Release the eye nut to lock the crimp height disc in position.



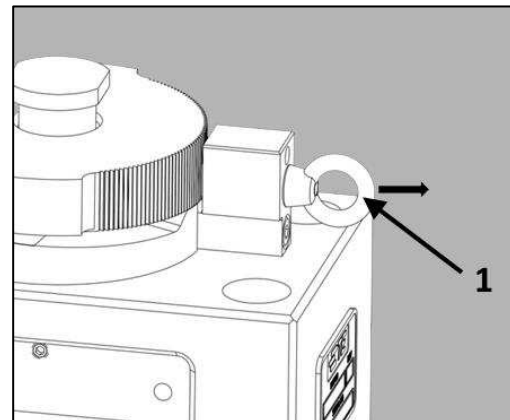
**NOTE**  
Every tenth (10 count) increment is denoted by a letter - A to G (reference Figure 13A).

Figure 13A



- 1** Decrease Crimp Height 0.044 mm
- 2** Increase Crimp Height 0.044 mm
- 3** Crimp Height Reference Notch

Figure 13B



- 1** Eye Nut



**NOTE**  
Ensure the gear teeth properly joined with top wire disc. (reference Figure 13B).

1. Once crimp height has been adjusted, run Die Holder through several cycles and inspect terminals CLOSELY, looking for the following:
  - a. Rough or sharp edges around the crimp barrels (flash), deformed crimps, bent terminals, or other defects could indicate worn or broken tooling.  
If necessary, replace tooling.
  - b. Incorrect crimp height.  
Make further adjustments to the Height Position Head.
  - c. Terminations that appear normal.  
Measure the crimp height of each termination, and record dimensions for reference.

**NOTE**

*Crimp height must agree with measurement specified on the Application Specification for the terminal.*

2. During continuous operation, check crimp height routinely, and adjust as-needed, to ensure the Die Holder is producing correct terminations.

#### 4. DIE HOLDER INSTALLATION AND REMOVAL

**DANGER**

*To avoid personal injury, make sure the power air source to the machine is turned off and power cord/air supply are disconnected before installing or removing the Die Holder.*

**NOTE**

*Always REMOVE the Ram Transportation Collar (if present) after installing the Die Holder in a machine and be sure to INSTALL the Ram Transportation Collar onto the Die Holder ram just prior to removing the Die Holder from the machine.*

**NOTE**

*With the Die Holder in the machine, NEVER attempt to cycle the machine under power without terminals properly loaded; as described in this Section; otherwise, the tooling may be damaged.*

**DANGER**

*To avoid personal injury, the Die Holder should be used ONLY in an appropriate terminating machine.*

##### 4.1. Installation

1. Align the top of the Die Holder (male) with the bottom of the Terminator Ram (female).
2. Align the Base Plate stops on the terminator with the slots in the Base Plate of the Die Holder and lock the Base Plate into place with the Terminator Base Plate Lock.

##### 4.2. Removal

1. Unlock the Terminator Base Plate Lock from the Die Holder Base Plate.
2. Remove the Die Holder from the terminator interface.

## 5. REPLACEMENT AND REPAIR

Customer-replaceable parts are listed in the product drawing. Stock and control a complete inventory to prevent lost time when replacement of parts is necessary. Parts other than those listed should be replaced by TE Connectivity to ensure quality and reliability. Order replacement dies through your TE representative or go to [TE.com](http://TE.com) and click the **Shop TE Store** link at the top of the page.

For field service, go to the [Service and Repair](#) page on the TE website, or send an e-mail to the address for your region in Table 1.

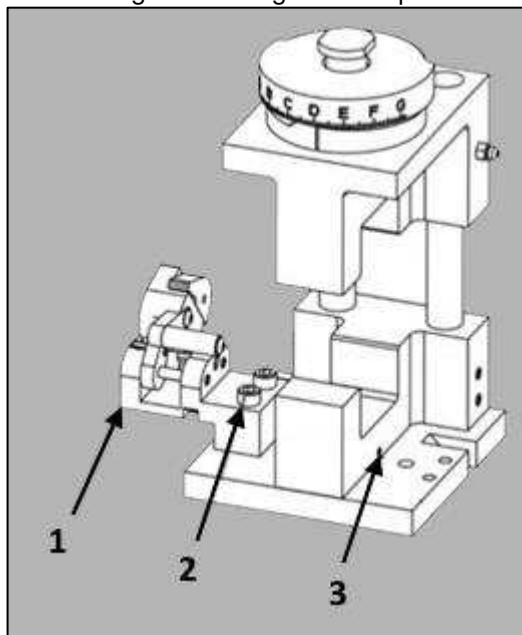
Figure 13: Service and repair.



Table 1: Field service e-mail addresses

Region	Address
Asia	<a href="mailto:Tefe1ap@te.com">Tefe1ap@te.com</a>
EMEA (including India)	<a href="mailto:Tefe1@te.com">Tefe1@te.com</a>
North America	<a href="mailto:Fieldservicesnorthamerica@te.com">Fieldservicesnorthamerica@te.com</a>
South America	<a href="mailto:FSE@te.com">FSE@te.com</a>

Figure 15: Original Clamp

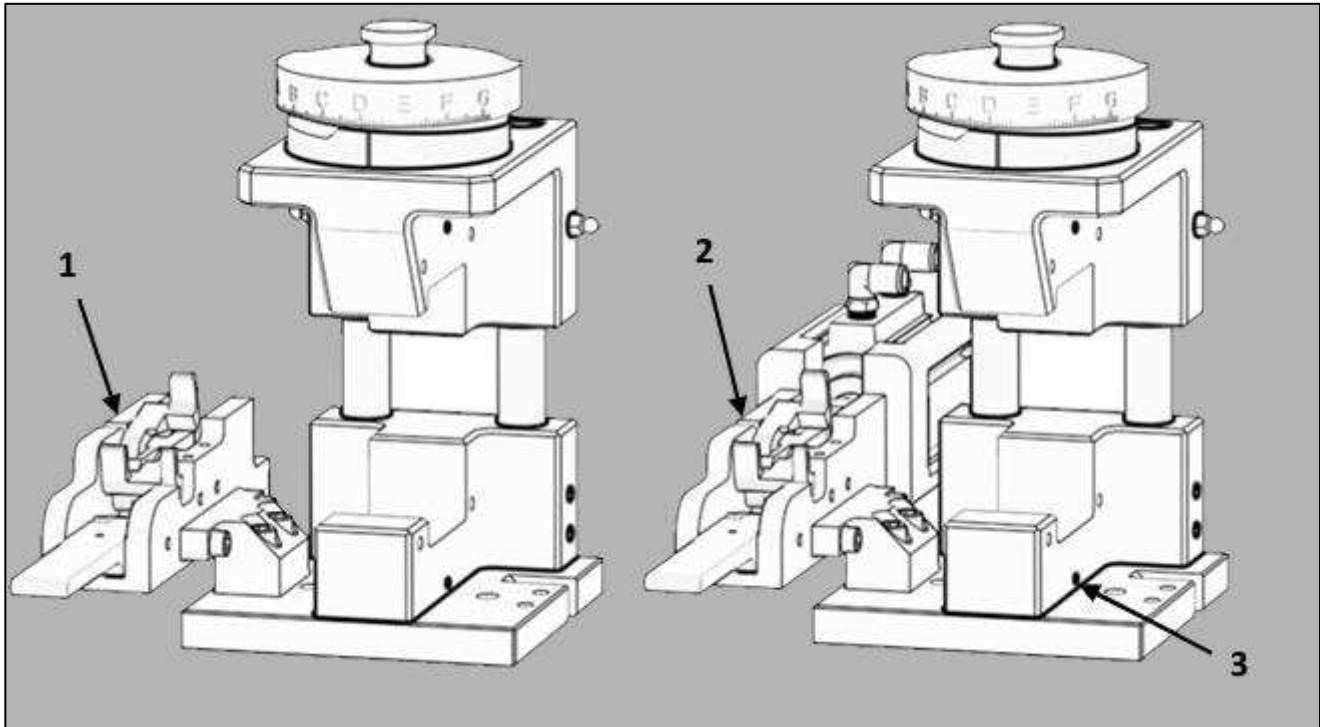


Item	Item Name	TE P/N	Qty
1	ASM, Wire Clamp	2305445-2	1
2	SCR, Socket Head Cap M6 x 16.0	2-18023-8	2
3	SCR, Set, Cone Pnt M4 x 6.0	992763-6	4

Figure 16

New Manual Clamp

New Automatic Clamp



Item	Item Name	TE P/N	Qty
1	Cable Clamp (Manual)	2364330-1	1
2	Cable Clamp (Automatic)	2364330-2	1
3	SCR, Set, Cone Pnt M4 x 6.0	992763-6	4

## 6. DISPOSAL

Contact TE for disposal.

## 7. REVISION SUMMARY

- Instructions about eye nut is added in Section 3.4.
- New image Figure 13A is added to show the detailed image of eye nut.
- Models in Figure 1, Figure 2, Figure 6A, Figure 8, Figure 10, Figure 12, Figure 13B are updated.