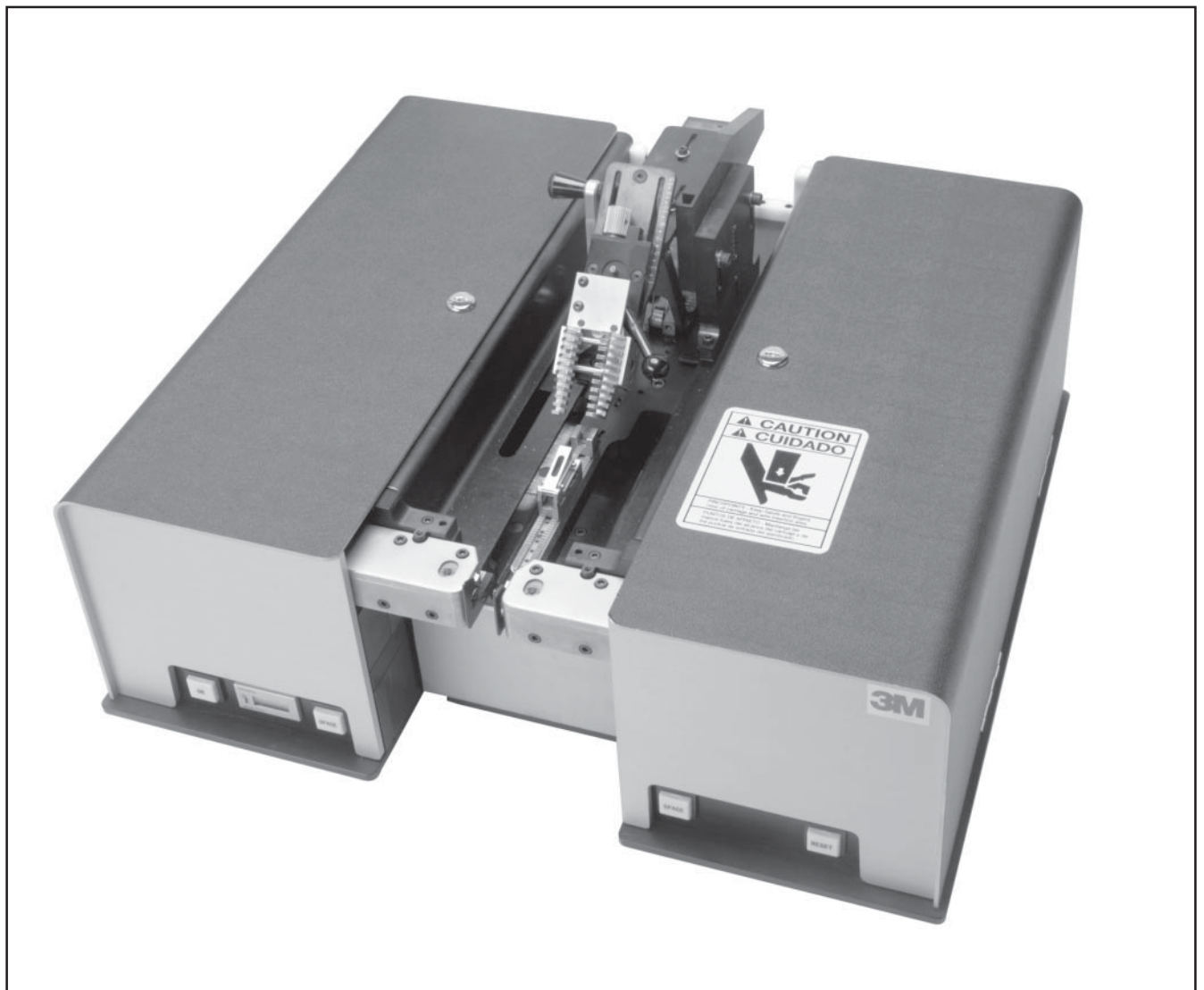


3M

Model 1100B CHG Terminator

Installation Instructions



Contents:

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1.0 Safety Information

1.1 Remove three bolts on each side of the crate. Remove the top of the crate. Remove the nuts and washers located on the 4" x 4" wood brace.

Note: *Mark the crate's edges and the 4x4 wood braces so that the crate can be reassembled correctly for future use.*

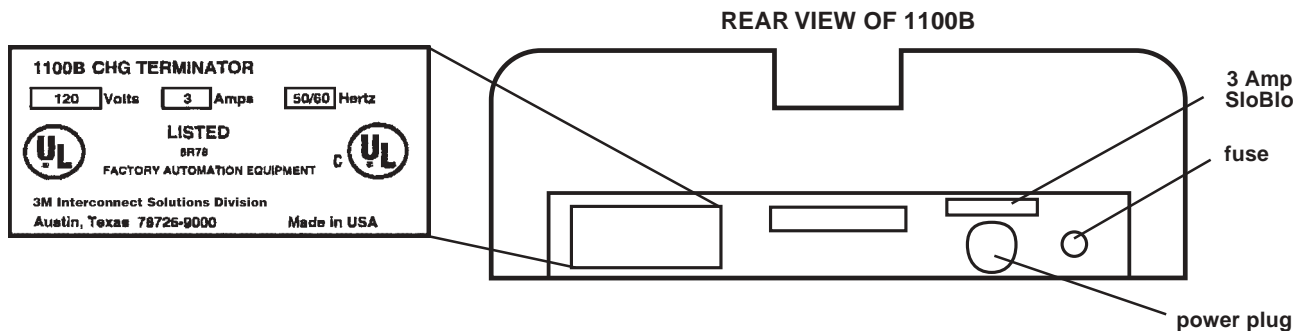
1.2 Lift the 1100B CHG Terminator out of the crate by placing your fingers under the machine base. **DO NOT LIFT** the machine by its covers. Save the packaging crate for future use.

1.3 Place uncrated machine on a table that will support at least 135 lbs.

1.4 Remove the tie wrap that secures the carriage in place.

1.5 Remove the power cord from the shipping crate. Do **not** plug in the power cord at this time.

1.6 This machine is UL listed factory automation equipment for USA and Canadian markets, File Number 170152.

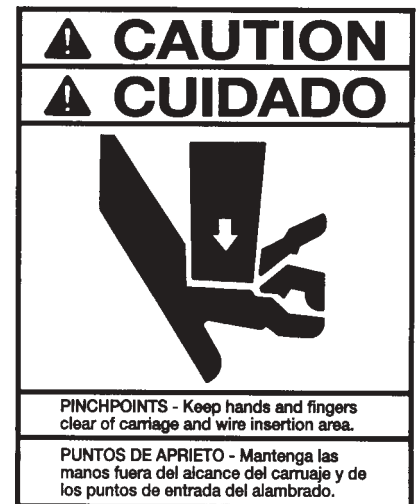


Note: *For necessary machine cleaning or troubles, disconnect the power cord.*

Note: *If the machine does not have power, check the fuse and check the door locks.*

Caution: *Do not operate the machine without the Electronic Program unit plates and nest settings as this may damage the machine.*

Caution: *During a termination cycle, the carriage will be positioned for the next termination. Also, when the last termination is completed, the carriage will be returned to the home position. Both of these operations are driven by powerful electric motors. Keep hands (both operator's and nearby personnel) away from these moving parts to avoid injury.*



2.0 Set-up and Adjustments

2.1 There are several adjustment and assembly procedures which must be performed before operating machine.

- Setup for the Electronic Program Unit (Step 2.5).
- Choose the correct nest (Step 2.2).
- Adjust the nest for the correct pin count (Step 2.3).
- Set up for 90° side entry or 180° center entry (Step 2.6).
- Adjust cable clamp setting (Step 2.7).
- Set ram assembly adjustment to proper wire insertion depth and connector body location (Step 3.2).

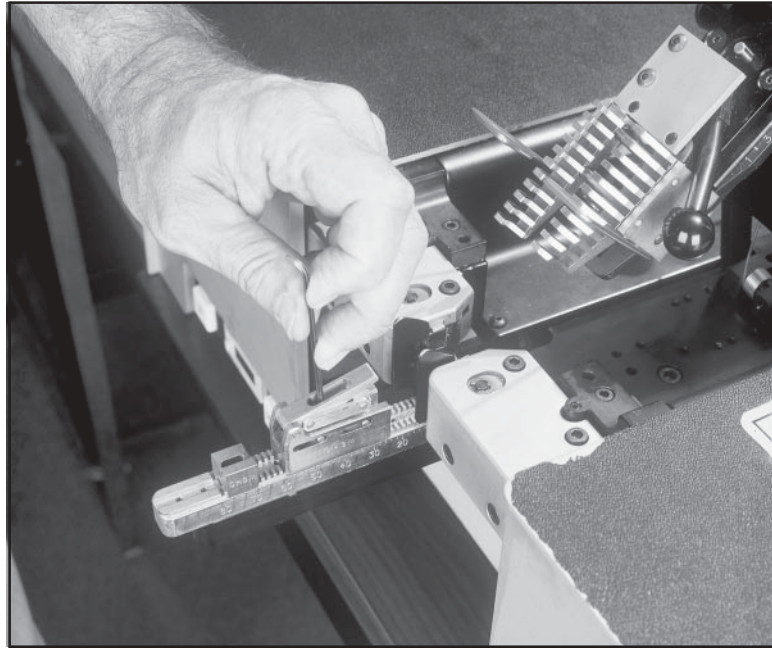
2.2 Connector Nest Setup

There are two **Connector Nests**. One for MIL/DIN connectors with slots to accommodate the MIL/DIN tabs and one for stackable connectors which has no tabs. The MIL/DIN connector will not go in a stackable connector nest. Part numbers for the connector nests:

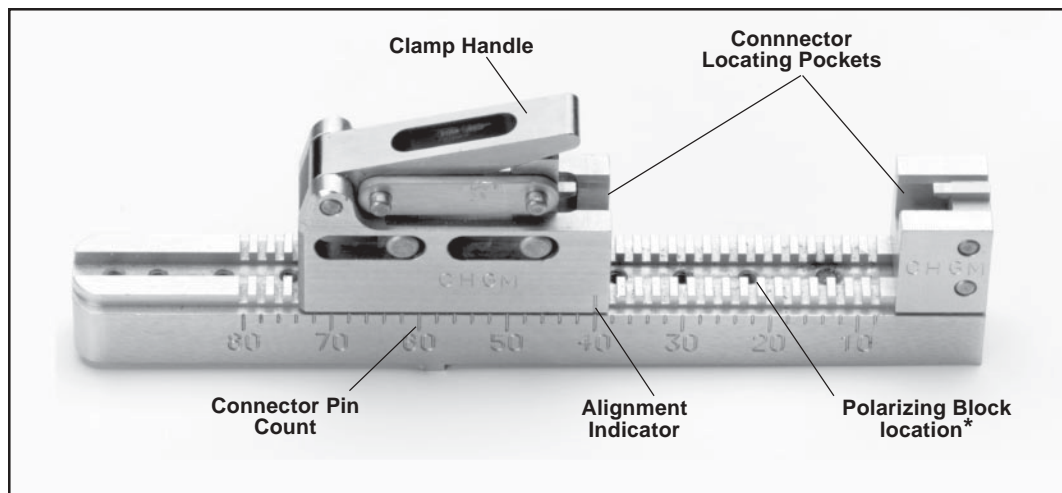
- 1100 Nest MIL/DIN 78-8094-4929-7 (CHGM)
- 1100 Nest 1 and 2 Row Stackable 78-8094-4928-9 (CHGS)

2.3 The **Connector Nest** must be adjusted for the correct connector length.

- To make the adjustment, insert a 3/32" hex wrench through the **clamp handle** and loosen a set screw.
- Move the connector clamp to the correct pin count line. Tighten the set screw.



2.4 The **Connector Nest** is mounted to the carriage base. The nests are keyed to the carriage base and are fastened with two #8-32 x 5/8" head cap screws. The screws enter from the underside of the carriage arm.

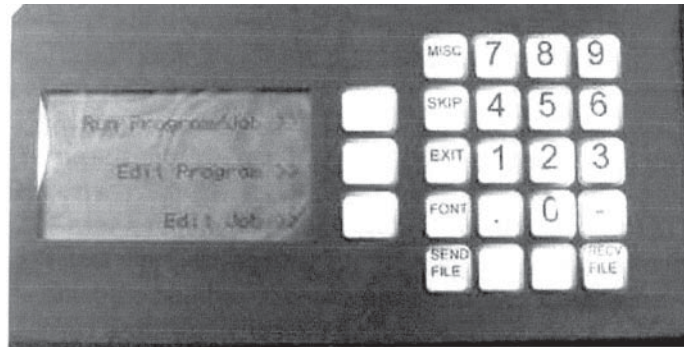


MIL/DIN Connector Nest (78-8094-4929-7)CHGM

**Note: The polarizing block is not shown. The polarizing block is mounted in this area of the connector nest. It is used to orient pin No. 1 in the harness assembly. It can be positioned from the left or the right in the connector nest.*

2.5 1100-EPP Electronic Program Unit

The EPP is used to control the **indexing steps** of the 1100B Universal Terminator. The EPP can be programmed to control the indexing of any connector pin count, automatically skip contacts not populated, and terminate multiple connector pin counts on one harness assembly.



Electronic Program Control Panel - Main Menu

Set-up: Assemble the EPP to the mounting arm of the stand.

Installation/attachment to the 1100B Universal Terminator

- Power to the 1100B Universal Terminator is turned off.
- Connect the yellow cord to the back of the 1100B Universal Terminator.
- Connect the yellow cord to the back of the 1100-EPP.
- Turn the 1100B Universal Terminator power on.

Note: *The mechanical program plates used with the 1000A cannot be used at the same time with the 1100-EPP.*

Assembly set up:

- Select or enter** a program number for the specific assembly to be made.
- Adjust** the NEST for the corresponding pin count of the connector being assembled.

Start the Assembly process:

- Press** "Run Program/Job" SEE Main Menu
- Press** "Program"
- Enter** a program number and press ENTER.

Make an Assembly:

- Insert a connector, and clamp a cable in place.
- "Pull Slide forward" means pull the connector carriage forward to the assembly position.
- Insert wires in the connector. After each termination the carriage will advance.
- As the last wire position is completed, the carriage will return to home position.
- Start the assembly again at step 4.

Note: *During the assembly cycle, the EPP will position the connector for the wire positions programmed. The EPP will also skip wire positions when programmed to do so. Do not try to insert wires when the machine is skipping wire positions.*

Caution:

The EPP does not control the machine functions. Once the "Pull Slide" function is completed the EPP cycle starts the program and the cycle has to be completed to the last contact programmed. The carriage can not be moved manually during a program cycle. During the program cycle, do not press the SPACE buttons to advance the carriage. This will cause the program to be out of sequence and damage could occur to the machine and harness assembly.

Programming the EPP - Definitions and Procedure

Program – A program is the assembly on **one connector** on one harness. Space for 200 programs is available.

Job – A job is an assembly with **more than one connector** assembled on one harness. Space for 20 Job programs is available.

Job Program – A job program allows multiple connectors to be assembled to the same harness. In a job program there will be more than one program included. Up to nine programs can be included in one Job Program.

Program Procedure:

1. Press "**EXIT**" to find the Main Menu on the keypad. From the Main Menu press "**Edit Program**".
2. Enter a required security code to start creating a program. The pre-set code is "123".
3. Select a project number for the program from the keypad. Press ENTER.
4. Enter the number of wire terminations. *Example: 2 rows of 20 on a side equals 40.* Press ENTER.
5. Next, program the wire color code if desired and wire termination skip function.

Note: *The color code entries can function as a training tool or an aid to keep track of the next wire in an assembly.*

6. To program a color code, a number is chosen from the chart on the screen.
7. Each position will require a color number be entered. The numbers are linked to specific colors. *Example: 1st Wire selection – left side wire 1, vio/wht; right side wire 1, wht/vio. Press NEXT. 2nd wire selection will appear.* Continue this process until every wire is programmed.
8. To skip a wire or to leave that contact open without a wire terminated, press SKIP instead of entering a color number. Enter SKIP for left side, then enter SKIP for right side. Press NEXT.
9. When the last position has been programmed the screen will return to the Main Menu.
10. A wire color will show up as a default color. If you don't want to program colors, leave that color and continue to press NEXT until you reach the last position or a position that will be skipped.

Note: *You can turn the color code selection off at the Main Menu.*

Single Row Connector Program Procedure: Repeat Steps 1 through 10 of the Program Procedure, with the following exceptions:

- a. At Step 4, for a single row connector, you must DOUBLE the contact number. *Example: If the connector has 20 contacts, you must enter 40.*
- b. On the side that no wires will be terminated, a default entry must be input.
- c. During the assembly procedure for a single row connector, the SPACE button on the side that will not receive a wire and the wire insertion side will have to be activated at the same time.

Programming a JOB:

1. Press EXIT on the keypad until the **Edit Job** screen appears. From the Main Menu press "Edit Job".
2. **Enter** a required security code to create a Job. Pre-set code is "123."
3. Select a JOB project number for the Job from the keypad Main Menu. Press ENTER.
4. **Enter** a Program project number. Press ENTER. This enters a previously designed program.

Note: *The Edit button will allow you to back up in order to correct mistakes.*

5. When the last program is entered, press DONE. The Main Menu will appear once more.

Security Code Modification:

The Security Code is used to enter design cable assemblies. To modify these codes:

- a. Choose Edit Program or Edit JOB.
- b. Press Change Code.
- c. Enter current code.
- d. Enter new 3 digit code number.
- e. Enter new code number again as prompted.
- f. Press Exit.

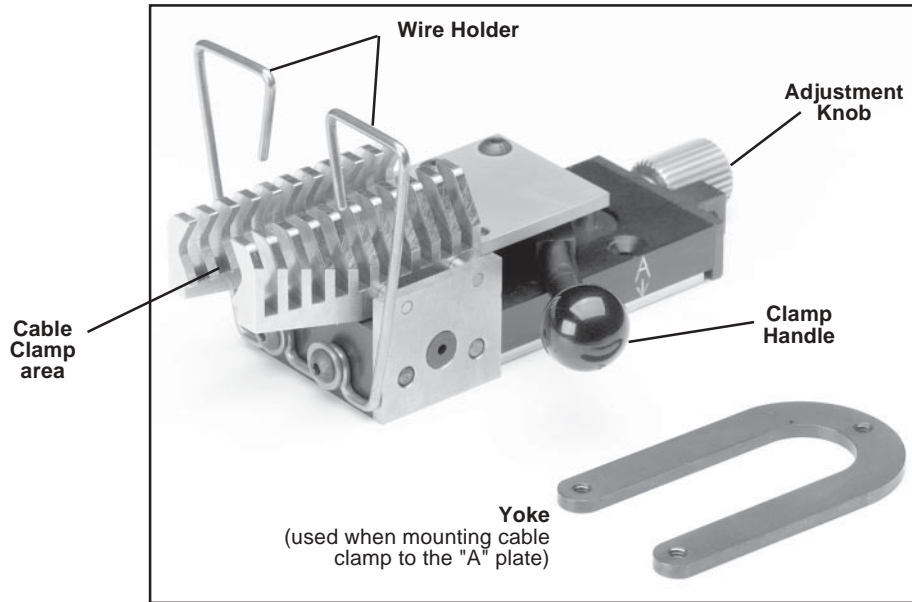
Information Storage: Software for transfer and storing programs on a computer program is available. Contact your 3M Sales Representative for software and instructions.

Reset Button: If the Reset button is pushed in the middle of a program cycle, the carriage will return to the home position. The program will automatically start over when the carriage is moved forward.

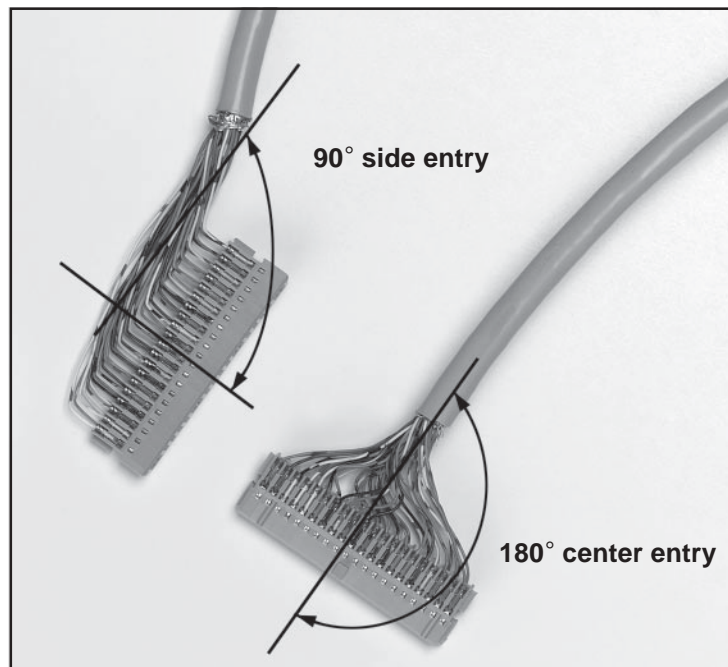
2.6 Assembly of Cable Clamp

The **Cable Clamp** must be adjusted for the specific diameter of the cable being assembled. The 1100B can be set up to assemble either 180° Center Entry or 90° Side Entry connectors.

- The cable clamp handle opens and closes the cable clamp.
- To tighten the cable clamp, rotate the adjustment knob clockwise; to loosen it, rotate counterclockwise.
- Proper tension on the cable is achieved when you can pull firmly on the cable and it does not move.
- For 180° center entry assembly, use Wire Holder #78-8118-0170-9. For 90° side entry assembly use Wire Holder #78-8118-0171-7 (provided with basic machine).



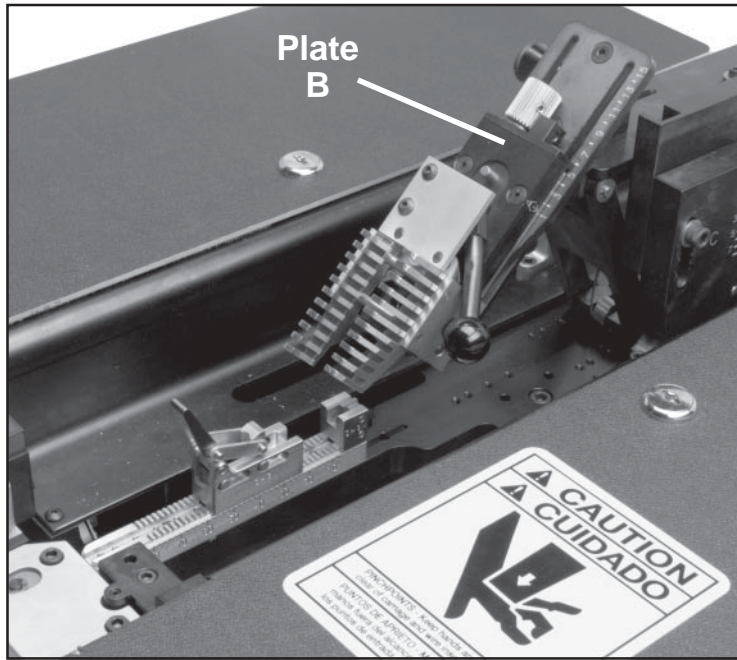
Cable Clamp



Assembly Styles

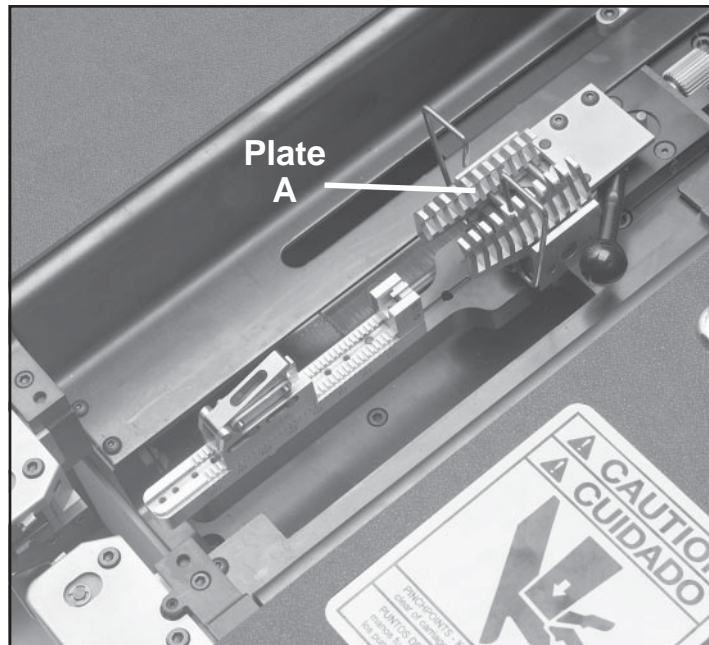
2.7 **Assembly for 180° center-entry application:** The **CENTER ENTRY ADAPTER** (78-8094-4930-5) is used in this application. The Center Entry Plates A, B, C, and D are mounted to the **CARRIAGE BASE**. This provides guidelines for the proper distance from the connector to the cable jacket end.

Adjustments will be made to the plates marked A, B, C, and D. See Chart #1 (page 9) for set-up positions.



Center Entry Adapter

2.8 **Assembly for 90° side-entry application:** The **CABLE CLAMP** is the only part used in this assembly. Plates A, B, C, and D are removed from the carriage base and the cable clamp is mounted on the **CARRIAGE BASE**.



Cable Clamp

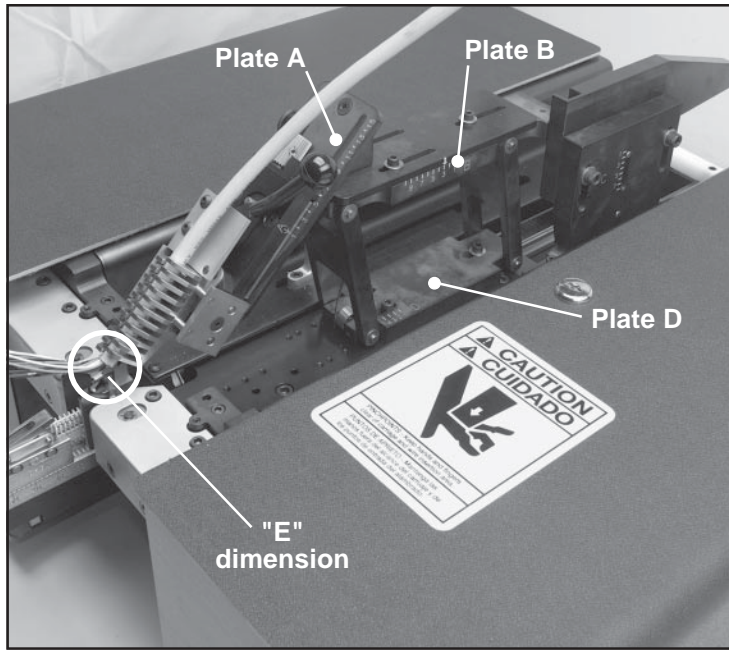
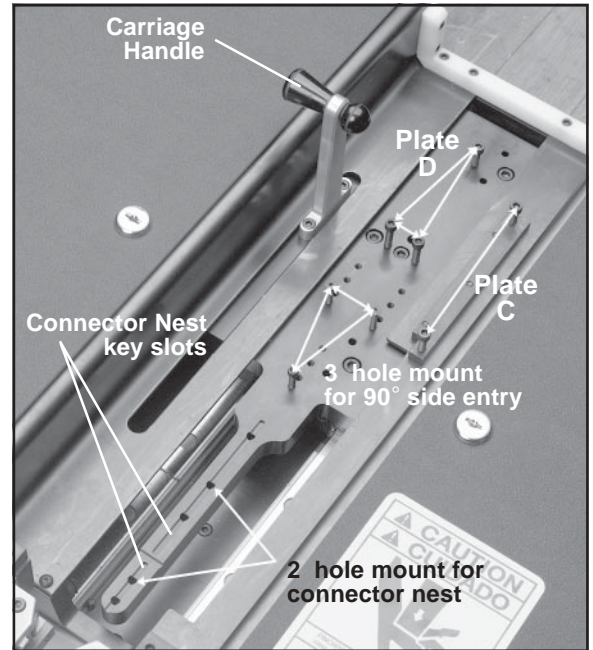


Plate Locations



Carriage Base

Chart 1: Center Entry Adapter Settings

The four settings for the Center Entry Adapter refer to the letters, ABCD, inscribed on the Center Entry Adapter. Use the matrix below for the setup of each size connector.

| Connector Size | Plate A* | Plate B* | Plate C** | Plate D*** | Suggested cable jacket exiting cable clamp "E" | Yield length from top of connector to jacket |
|----------------|----------|----------|-----------|------------|--|--|
| 6 | 1 | 5 | 1 | 4 | 0 | 0.75" |
| 8 | 1 | 5 | 1 | 4 | 0 | 0.75" |
| 10 | 1 | 5 | 1 | 4 | 0 | 0.75" |
| 14 | 1 | 5 | 1 | 4 | 0 | 0.75" |
| 16 | 1 | 3 | 2 | 2 | .062" | 0.75" |
| 20 | 1 | 3 | 2 | 2 | .062" | 0.75" |
| 26 | 1 | 3 | 2 | 2 | 0.12" | 0.75" |
| 30 | 1 | 2 | 3 | 2 | 0.12" | 0.75" |
| 34 | 5 | 5 | 4 | 2 | 0.12" | 0.75" |
| 40 | 5 | 5 | 4 | 2 | 0.25" | 0.87" |
| 46 | 6 | 5 | 6 | 2 | 0.25" | 0.87" |
| 50 | 6 | 5 | 6 | 2 | 0.25" | 0.87" |
| 60 | 6 | 5 | 6 | 2 | 0.25" | 0.87" |
| 64 | 6 | 5 | 6 | 2 | 0.25" | 0.87" |
| 72 | 6 | 5 | 6 | 2 | 0.25" | 0.87" |

Note: All settings are targets and some variance is allowed per customer requirements.

* Align numbers with arrow.

** Align numbers with round pin in slot next to the number.

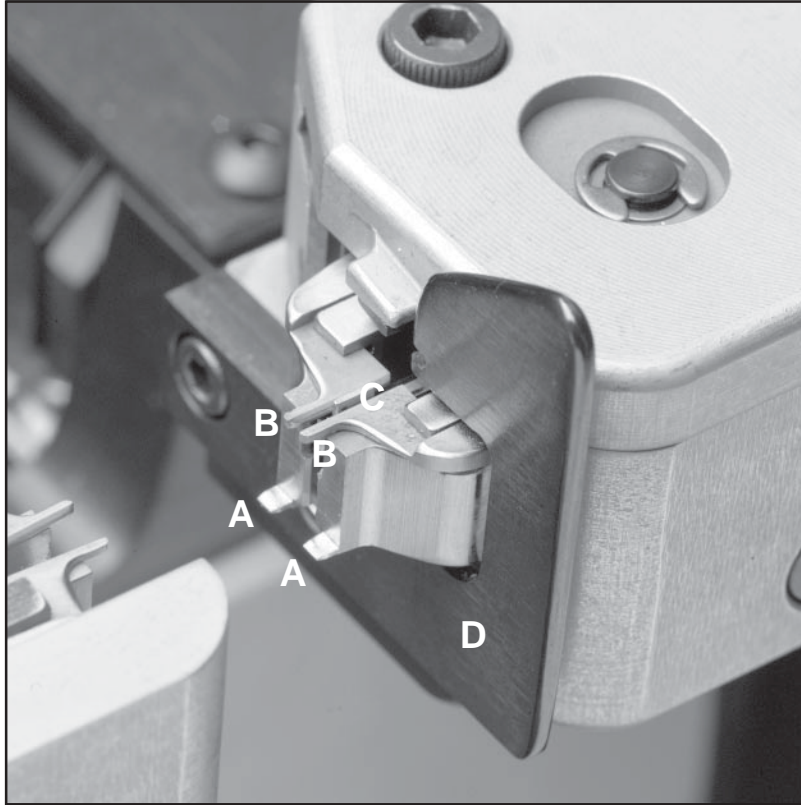
*** Align numbers with bracket head bolt next to the number.

Warning: Improper setups can damage the Center Entry Adapter. Manually check setups before operating the machine.

3.0 Ram Adjustments

3.1 The RAM ASSEMBLY features:

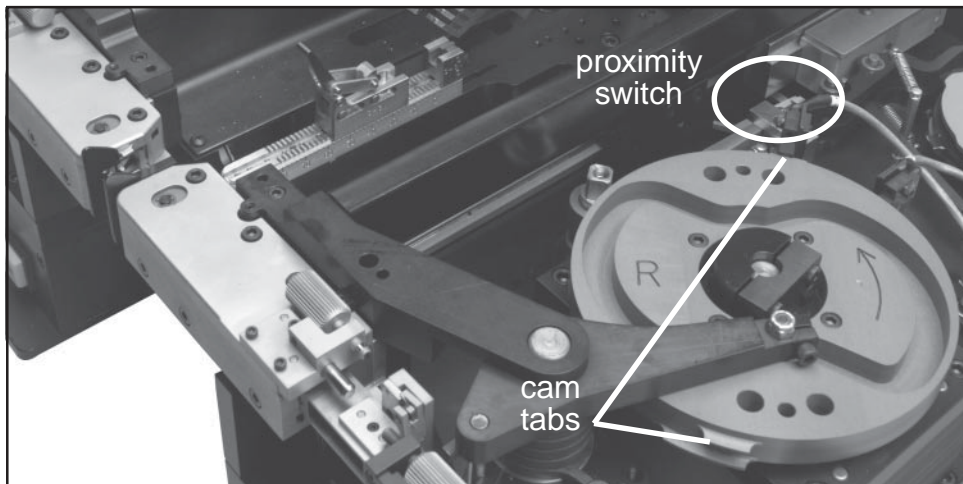
- A) **WIRE GUIDES (left and right):** support and locate connector's body in the nest.
- B) **WIRE GRIPPERS (left and right):** grip the individual wires.
- C) **WIRE INSERTION BLADE:** insert and terminate the wire.
- D) **CUT-OFF KNIFE :** cuts the wire to length (left and right).



Ram Assembly

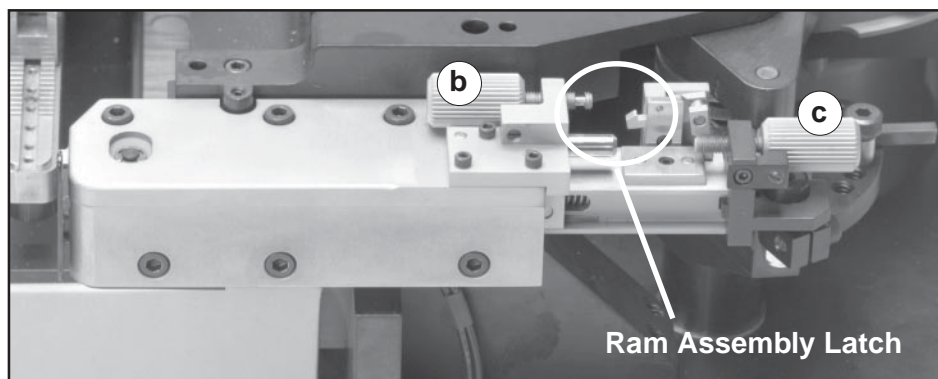
The RAM ASSEMBLY can be manually cycled by rotating the left or right wire insertion cam in the **direction** of the arrow on the cam.

Note: Always return one of the two cam tabs (on opposite sides of the cam) to the proximity switch location. Always rotate the cam in the direction of the arrow on the cam.



Cam Assembly

- 3.2 With the carriage system brought forward in the assembly position and a connector body placed in the connector nest the following processes occur:
- a) **WIRE GUIDE** tips enter the connector body to center the contact location **each time** the machine cycles.
 - b) At the base of the **wire guide**, a vertical flat surface comes in contact with the connector surface for stability. Adjustment of this wire guide feature is achieved by using the **CLOSURE ADJUSTMENT KNOB (b)**. This adjustment is essential during every assembly set-up. An adjustment is specifically required when changing from MIL-DIN to 1 or 2 row stackable connectors. The adjustment knob rotates to a series of audible "clicks." Each click represents approximately .001". Rotating the knob in a counterclockwise direction moves the surface inwards.
 - c) The insertion depth of a terminated wire is controlled by the **INSERTION DEPTH ADJUSTMENT KNOB (c)**. This knob operates in the same manner and the same precision as the Closure Adjustment Knob, see Wire Insertion Depth Table on the next page. Rotating the knob in a counterclockwise direction inserts the wire deeper.
 - d) Ram Assembly Latch locks the ram assembly in place during wire termination.



Ram Assembly

- 3.3 To adjust the wire guide snugly against the plastic body:
- Back the wire insertion blade so that it doesn't make contact with the connector.
 - Back the wire guide out so that it doesn't make contact with the connector.
 - Manually rotate the cam so that the wire guide is fully extended.
 - Adjust wire guide so that the vertical face of the wire guide makes light contact with the connector body.
 - Repeat this process on the opposite side Ram Assembly.
 - Adjust both insertion blades so that the wire is seated to the correct depth.
 - The Ram Assembly Latch will latch together during the machine cycle.

Note: *Always return the cams back to the start position with the index tabs in line with the proximity switch.*

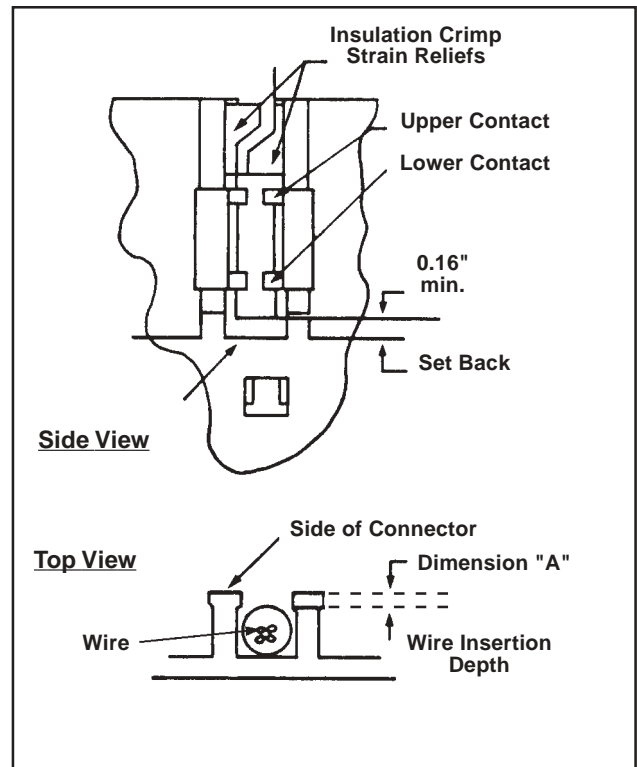
4.0 Wire Termination Quality

Note: All wire terminations must be inspected for the following:

- 4.1 Wire terminations must be seated in **both sets** of contacts.
- 4.2 End of the wire must be set back from the bottom of the wire slot as shown.
- 4.3 Insulation crimp should be complete, with both strain reliefs bent over.
- 4.4 Measure wire insertion depth (distance from wire to side of connector). Refer to the chart below for proper depth.

Note: 3M makes a modified 3865 Caliper for these measurements.

- 4.5 Check for any connector body damage.
- 4.6 Measure between the two contacts.
- 4.7 Measure both sides of the connector.



Wire Insertion Depth

| | .033" dia. wire | .040" dia. wire |
|-----------------------------|--------------------|--------------------|
| MIL/DIN Connector | .060" ± .003 | .052" ± .003 |
| 1 or 2 Row Stackable | .042" ± .003 | .035" ± .003 |

5.0 General Maintenance

- 5.1 For maintenance, cleaning, trouble shooting, and setup, turn machine off and **ALWAYS disconnect electric power supply**.
- 5.2 A daily general cleaning of wire, insulation and any debris around the machine is recommended
- 5.3 Once a month, lubricate and clean a machine in daily use.

To clean and lubricate the rams:

- Remove the 6 Allen screws and the top and side plates.
- Remove the ram body and clean in a degreasing solution.
- Apply light machine oil (not sprayed) to all moving parts of the ram and re-assemble.
- Also apply oil to the carriage ways.

6.0 Ram Assembly Cleaning

6.1 Turn machine off and disconnect power. Unlock machine and open top covers.

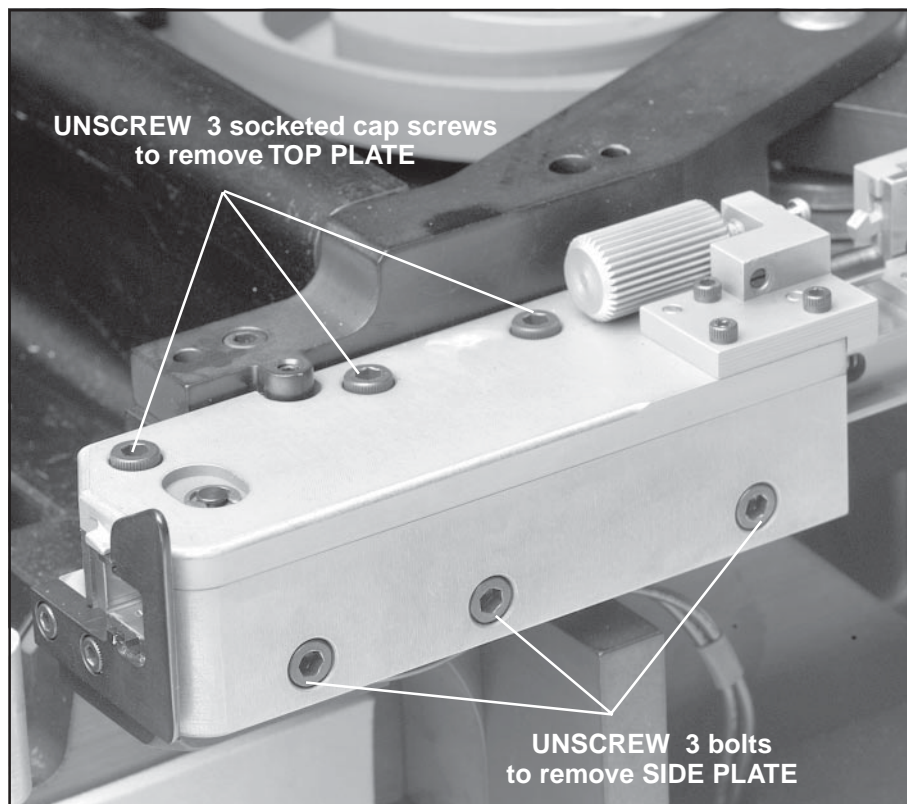
Note: Do not rotate adjusting screws during cleaning, as the machine will then have to be recalibrated.

6.2 Remove the three socket head screws on the **top plate** of the right insertion head.

6.3 Carefully lift the top plate. Make sure the locating keys stay with the head body. If they have lifted with the plate itself, remove them and place them back in their proper location in the head body.

6.4 Remove the three socket head screws on the **side plate** of the right insertion head. Hold the head in place until all the screws are removed.

6.5 Carefully remove the side plate. Make sure the locating keys stay with the head body. If they have lifted with the plate itself, remove them and place them back in their proper location in the head body.



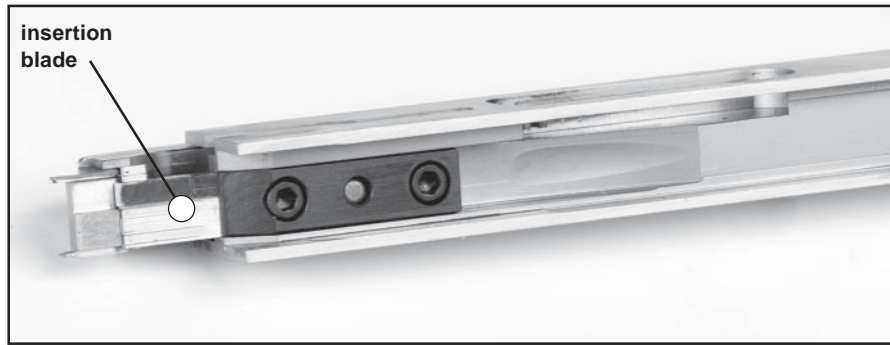
Ram Assembly

6.6 Carefully remove the complete internal portion of the insertion head; make certain all of the parts stay together. Place on a clean area of the workbench so that no parts are lost during the cleaning operation.

6.7 Carefully remove the wire guide front "R". The wire grip spring can now be removed.

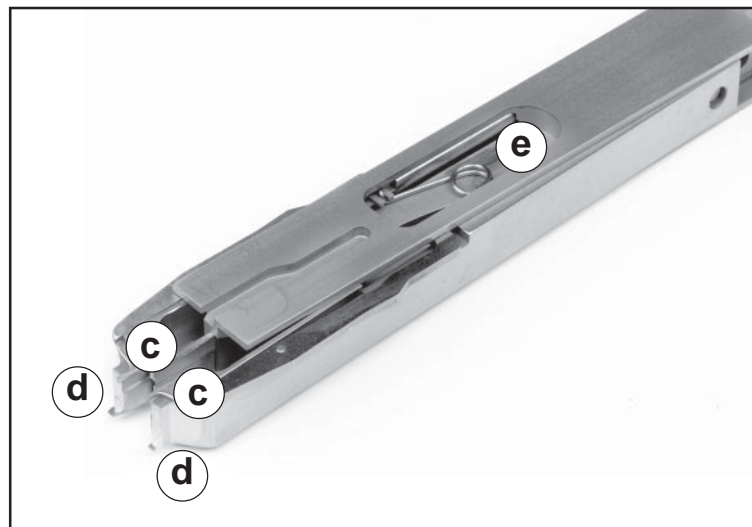
6.8 Carefully remove the wire guide rear "L" from the insertion blade support body.

6.9 Inspect the insertion blade for damage. Replace, if necessary.



Insertion Blade Holder

- a) **CUT OFF KNIFE** (left & right, not shown)
- b) **WIRE INSERTION BLADE** (common to both ram assemblies)
- c) **WIRE GRIP** (left and right) (front and back)
- d) **WIRE GUIDE** (left and right) (front and back)
- e) **GRIPPER SPRING** (common to both Ram Assemblies)



Ram Assembly Parts

6.10 Place all the parts in an ultrasonic cleaner. Remove parts and blow clean with high pressure air, be careful not to lose the pins and rollers located in the ram block.

Note: *Lightly oil the parts as they are reassembled.*

6.11 Reassemble the wire guide Rear "D" on the insertion blade support body by compressing the spring and locating the pin on the wire guide rear "D" through the slot. Release the spring against the pin. The latch for the connector holding device (located on the end where the ram bar engages the cam follower) will have to be rotated to allow full assembly of the wire guide rear "D".

6.12 Install the wire guide front "D" on the pin from the wire guide rear "D".

6.13 Install the assembly in the insertion head body with the slot on the right end, capturing the cam follower.

6.14 Install the side plate on the locating keys and insert the three socket head screws.

6.15 Install the wire gripper spring.

6.16 Install the top plate on the locating keys. Make sure the post from the wire hook is inserted in the cam slot in the bottom of the top plate.

- 6.17 Repeat steps 6.2 through 6.16 for the left insertion head.
- 6.18 Make sure the motor cams are in the home position, with the lower micro switch rollers in the relieved portion of the cam. If necessary, manually rotate the cams to position the micro switch rollers. Place a connector in the nest and lock in place. Pull the carriage all the way out. Manually rotate the right motor cam counterclockwise and the left motor cam clockwise **simultaneously** to the full insertion depth.
- Check that the connector is supported by the wire guides with the connector in the center of the nest and that the insertion blades are at the same depth in the connector. Continue to rotate the cams until they are in the home position. Remove the connector and check the strain relief. Return the carriage to the home position by manually operating the carriage solenoid.
- 6.19 Close and lock covers. Connect power and turn on the machine.
- Caution:** *Keep hands and fingers clear of carriage and wire insertion area.*
- 6.20 Insert a connector in the nest and run some wire insertions in the normal manner. Remove connector and check insertion depth. If depth is not correct, readjust to specification. Return carriage to home position when complete. Machine is ready for operation

7.0 Machine Specifications

| | |
|---------------------------|---------------------------|
| Type: | Bench Top |
| Machine Dimensions: | |
| Height: | 280 mm (11 inch) |
| Width: | 980 mm (38.6 inch) |
| Depth: | 460 mm (18 inch) |
| Machine Weight: | 60 kg (132 lbs) |
| Power Requirements: | 120 volt, 3 amp, 50/60 Hz |
| Machine Versions | 1100A, 1100B |

8.0 Appendix

Chart 2: Replacement Parts List

| 3M Part Number | Description |
|----------------------|------------------------------------|
| 78-8118-0188-1 | 1100-71C Knife Left - carbide tip |
| 78-8118-0189-9 | 1100-72C Knife Right - carbide tip |
| 78-8094-4908-1 | 1100-090 Wire Guide Rear Right 3M |
| 78-8094-4909-9 | 1100-091 Wire Guide Rear Left 3M |
| 78-8094-4910-7 | 1100-092 Wire Guide Front Right 3M |
| 78-8094-4911-5 | 1100-093 Wire Guide Front Left 3M |
| 78-8094-4912-3 | 1100-094 Wire Grip Front Right |
| 78-8094-4913-1 | 1100-095 Wire Grip Front Left |
| 78-8094-4914-9 | 1100-096 Wire Grip Rear Right |
| 78-8094-4915-6 | 1100-097 Wire Grip Rear Left |
| 78-8094-4927-1 | 1100-115 Insertion Blade |
| 78-8096-9943-8 | 1100-235 Gripper Spring |

For technical assistance contact 3M Interconnect Solutions Division at: 1-800-225-5373 (phone)
or contact your 3M Sales Representative. 1-800-325-5329 (fax)

Important Notice

Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

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