

Figure 1

1. INTRODUCTION

This instruction sheet covers the installation and use of AMP* Tooling Kit 768900-9, which is used in the CHAMPOMATOR* 2.5 Bench Terminating Machine to apply discrete-wire, jacketed cable to the CHAMP with Clamp Connectors listed in AMP Catalog 82008.

Read this sheet thoroughly before installing or using the tooling kit.

NOTE

All dimensions are in millimeters [with inches in brackets]. Figures and illustrations are for identification only and are not drawn to scale.

NOTE

These instructions are supplied in the documentation package for Tooling Kit 768900-9. Be sure to retain all material in the documentation package for reference. For detailed information on the operation of the CHAMPOMATOR 2.5 Bench Terminating Machine, refer to the AMP Customer Manual supplied with the machine. For additional information on CHAMP Connectors, refer to AMP Catalog 82008.

2. DESCRIPTION

As shown in Figure 1, the tooling kit includes a mandrel assembly, two inserter assemblies, a hand tool, and set-up gauges (not shown). The mandrel assembly includes two spring-loaded connector

nests, one for use with plug connectors and the other for use with receptacle connectors (plug-type connector nest shown in Figure 1). During use, the connector is positioned in the nest and secured in place with the Inner and Outer Connector Clamps.

During machine operation, the operator selects the proper wire(s) and moves the wire(s) down to the proper side of the mandrel. As each wire is brought into the wire-receiving slot of its inserter, a sensor is triggered. The air cylinder on that connector side is then fired.

NOTE

When only one wire is being terminated, only one air cylinder is fired.

When the air cylinder is fired, it pushes the inserter forward, which pushes the wire into the contact. As the wire is inserted, the inserter trims the wire to the correct length.

The air cylinder then retracts the inserter, permitting the carriage to move to the next connector position.

3. INSTALLATION PROCEDURE

DANGER

It may be necessary to open or remove machine covers to perform the following procedures. Disconnect the power to the control module and lockout the pneumatic valve BEFORE installing the tooling onto the base machine. Replace all covers before operating the machine.

3.1. Mandrel

NOTE

All inserters MUST be removed prior to mounting or removing the mandrel.

The mandrel is held in place by two hex head cap screws. Refer to Figure 2. To mount the mandrel, proceed as follows:

1. Make sure that the two mounting screws are removed from the mandrel mounting area of the machine.
2. Place the mandrel on the machine, with the connector-fixture end of the mandrel facing outward. Align the mounting holes on the mandrel with the threaded mounting holes on the machine.
3. Insert the mounting screws through the mandrel, and into the machine, then evenly tighten the screws with a 5/32-in. hex wrench.

3.2. Inserters

Each inserter is positioned with two alignment pins, and is held in place by two hex head cap screws. Refer to Figures 2 and 3. To install the inserters, proceed as follows:

1. Make sure that the mounting screws are removed from the carriage surface.
2. Position each inserter so that the ram on the air cylinder engages the inserter shaft, as shown in Figure 3. Locate the inserter over the two alignment pins (refer to Figure 2).
3. Insert, but do NOT tighten the two mounting screws for each inserter.
4. Push the inserters toward the mandrel, then tighten the mounting screws with a 5/32-in. hex wrench.

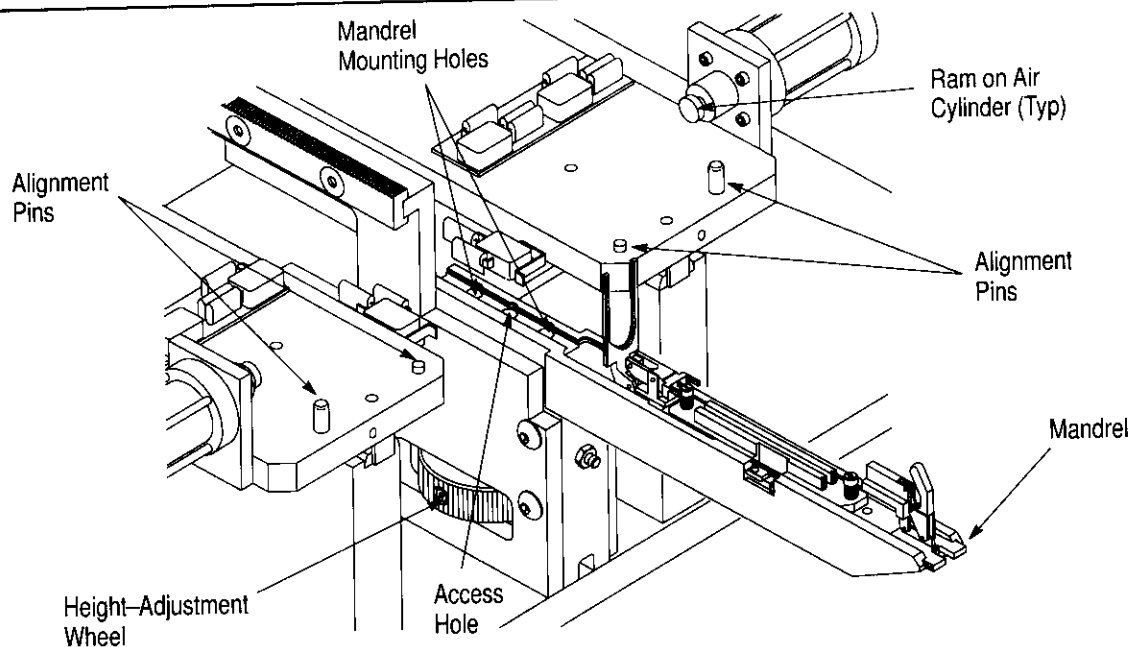


Figure 2

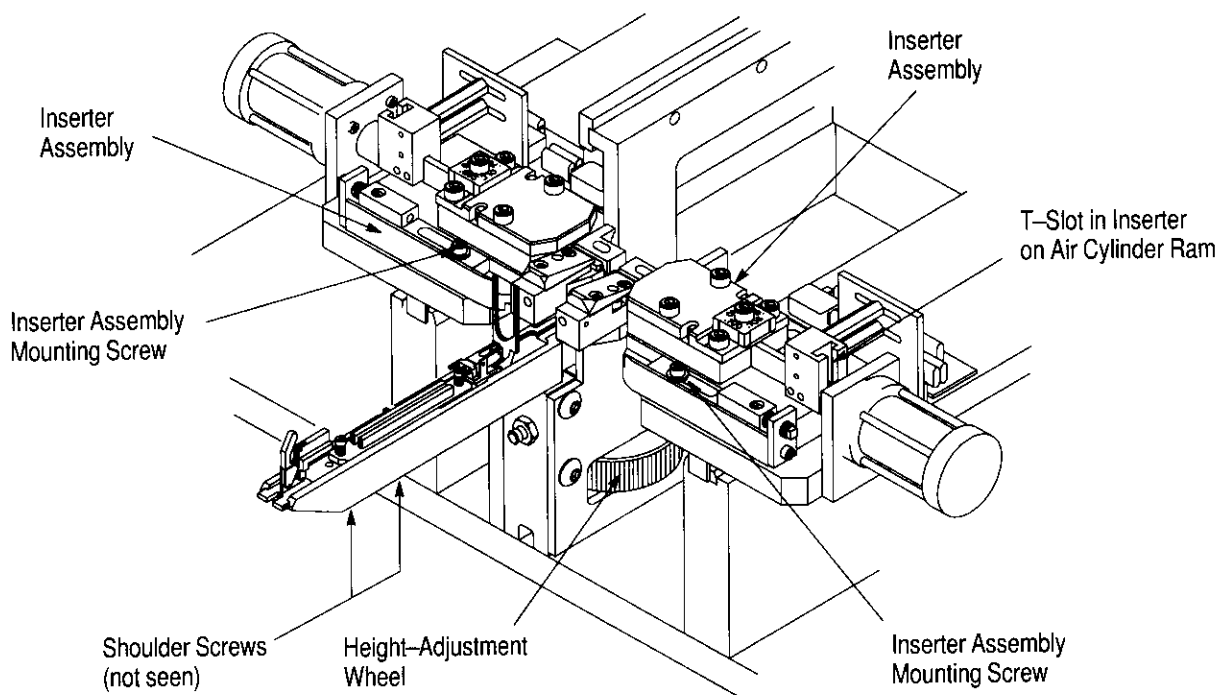


Figure 3

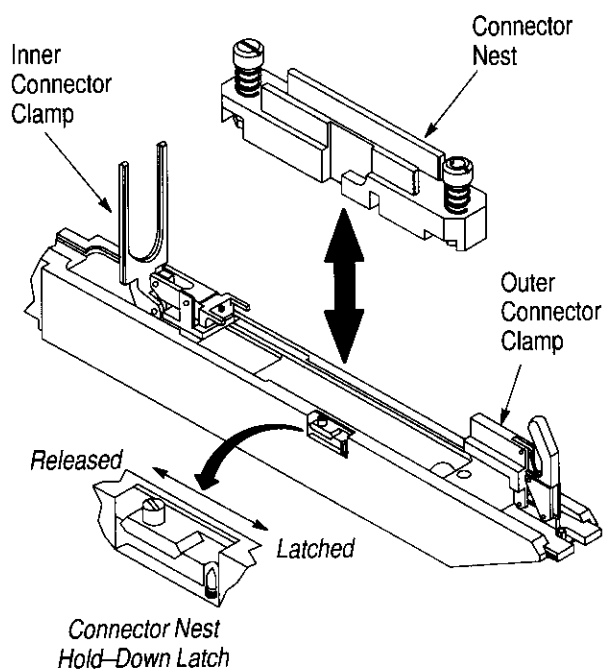


Figure 4

4. CHANGING THE CONNECTOR NEST

Connector nests can be changed to accommodate plug or receptacle connectors. To change the nests, refer to Figure 4 and proceed as follows:

1. Release the Inner and Outer Connector Clamps and remove the connector from the Connector Nest, if installed.
2. Slide the Connector Nest Hold-Down Latch to the RELEASED position and pull Connector Nest upward to remove.
3. With the Connector Nest Hold-Down Latch in the RELEASED position, insert the replacement Connector Nest and, while pressing down on the nest, slide the Connector Nest Hold-Down Latch to the LATCHED position.

5. TOOLING ADJUSTMENTS

DANGER

It may be necessary to open or remove machine covers to perform the following procedures. Disconnect the power to the control module and lockout the pneumatic valve BEFORE adjusting tooling. Replace all covers before operating the machine.

5.1. Connector/Mandrel Height

The mandrel assembly height is adjustable to locate the connector contacts in correct relation to the inserter assemblies' inserter tips.

1. Turn off the power to the machine and disconnect the machine's air supply
2. Place an unloaded connector into the connector nest and clamp the connector in place with the inner and outer connector clamps.
3. Manually pull out the machine's carriage assembly until the inserters align with the connector's contact slot.

4. Manually extend the inserter tips until they are near, but not inserted into, the contacts. The inserter tips should align with the contacts as shown in Figure 5. If not, the mandrel height must be adjusted.

To adjust the mandrel height:

1. Locate the locking screw, which is reached through an access hole in the back of the mandrel. Refer to Figure 2. Loosen the locking screw by turning the screw COUNTERCLOCKWISE with a 5/32-in. hex wrench.
2. Turn the mandrel height adjustment wheel to bring the mandrel to the correct height. Turning the wheel CLOCKWISE RAISES the mandrel, and turning the wheel COUNTERCLOCKWISE LOWERS the mandrel.

CAUTION

Do NOT raise or lower the mandrel while the inserters are extended, or damage to the inserters may result. Manually retract the inserters BEFORE changing the mandrel height.

3. When the correct height has been reached, tighten the locking screw, manually retract the inserters, and return the carriage to its initial position, and remove the connector.

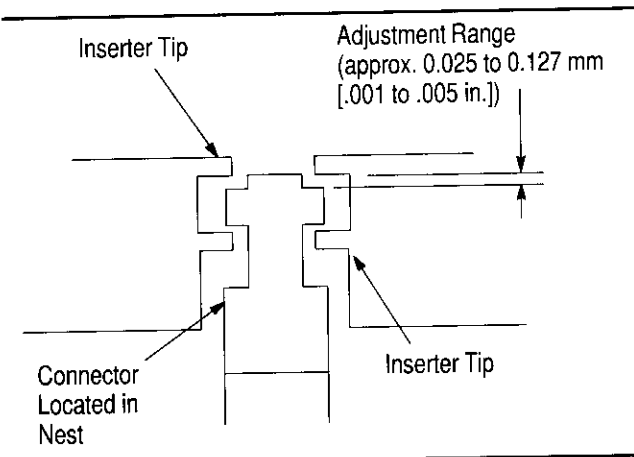


Figure 5

5.2. Inserter Assemblies

A. Inserter Position

The inserter position is important in that the guiding surfaces for the wire must control the wire up to the time it enters the connector contact. To adjust the inserter position:

1. Load a connector into the mandrel assembly and secure it in place.
2. Index the machine to connector contact no. 1.
3. Using a 5/32-in. hex wrench, loosen the two inserter assembly mounting screws.

4. Loosen the sliding block mounting screw. Refer to Figure 1.

5. While viewing the inserter guiding surface, use a 5/32-in. open-end or box wrench and turn the inserter position adjustment screw to move the assembly. Refer to Figure 1. Turn the screw CLOCKWISE to move the assembly AWAY from the connector, and COUNTERCLOCKWISE to move the assembly TOWARD the connector.

6. Check that the inserter guiding surface is within the adjustment area, as shown in Figure 6.

7. Using a 5/32-in. hex wrench, tighten the sliding block mounting screw and the two inserter mounting screws.

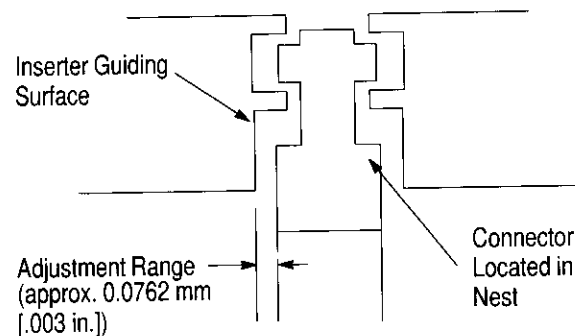


Figure 6

B. Wire Insertion Depth

The length of travel of the inserter ram may be adjusted. Normally, the inserters will not require this adjustment unless the insulation diameter is changed. To adjust the depth, refer to Figure 1 and proceed as follows:

1. Look at the top of the inserter assembly and read the wire insertion depth stop currently in use.
2. Using a 5/32-in. hex wrench, remove the stop mounting screw, and remove the stop from the inserter assembly.
3. Determine the stop dimension from the marking on the top of the stop directly over the inserter tip.

NOTE

Each stop is designed with four stop dimensions. For example, the 18.034 mm [.710 in.] stop also includes a 17.907 mm [.705 in.] section, a 17.780 mm [.700 in.] section, and a 17.653 mm [.695 in.] section.

4. Measure the insulation diameter of the wire presently being used, then measure the insulation diameter of the new wire to be used.
5. Determine the difference between the two insulation diameters, then subtract one half of this difference. Use the resulting number to determine

the dimension of the new stop (add the figure to the old stop dimension if the diameter is increasing, subtract if the diameter is decreasing).

- Place the correct stop onto the inserter assembly and install the stop mounting screws.

NOTE

Make sure that the inserter vane switches "make" in the inserted position by using Diagnostic Mode 3 on the control module. Refer to the Customer Manual supplied with the module.

C. Inserter Guide Opening

The inserter guide opening helps control the placement of the wire into the connector contacts. This gap should be adjusted to accommodate changing wire outside diameter. To adjust the opening:

- Remove the inserter assembly from the machine by removing the two inserter mounting screws.
- Remove the inserter tip subassembly from the inserter assembly.
- Using a 7/64-in. hex wrench, loosen the guide block and housing mounting screws.
- Measure the outside diameter of the new wire to be used.
- Locate the setup gage that is the same size as, or that is one size larger than, the measured wire. Insert the setup gage into the inserter assembly until the gage bottoms against the guide block. Refer to Figure 7.

- Gently force the guide blocks against the setup gage and secure.

- Re-install the inserter subassembly.

- Install the inserter assembly onto the machine as previously described.

- Repeat the above procedure for the other inserter assembly.

- Extend the plunger to secure the connector.

- Load the cable into the cable clamp, if applicable. Refer to the instructions supplied with the clamp.

D. Wire Clamp Force (Figure 7)

The clamp force exerted on the wire during the termination process controls the wire's vertical placement in the connector contacts. Excessive clamp force will tend to extrude the wire insulation during termination, resulting in poor termination quality. To adjust the force:

- Using a .035-in. hex wrench, loosen the wire clamp locking screw.

- Using a .050-in. hex wrench, turn the wire clamp adjustment screw. Turning the screw **CLOCKWISE** will **INCREASE** the clamp force, and turning the screw **COUNTERCLOCKWISE** will **DECREASE** the clamp force.

- Terminate several wires to verify the adjustment.

- Using a .035-in. hex wrench, tighten the wire clamp locking screw.

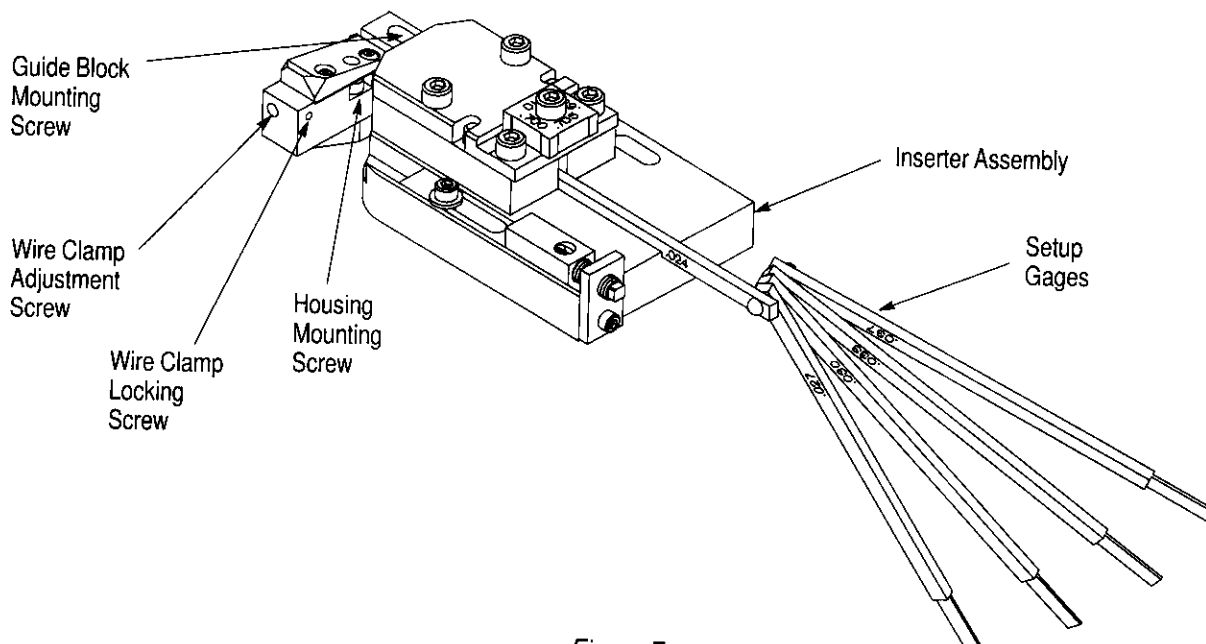


Figure 7

6. OPERATION

1. Place the connector to be terminated into the connector nest. See Figure 8.
2. Close the inner and outer connector clamps to clamp the connector into the nest. See Figure 8.
3. Load the cable into the cable clamp of the machine and into the cable clamp of the connector. See Figure 9.
4. Crimp the cable in the connector cable clamp using the hand tool, as shown in Figure 9.

NOTE

The crimp closure dimension of the connector cable clamp is determined by adjusting the setscrew in the hand tool jaw using a 1/8 in. hex wrench. The setscrew is accessible through the hole in the side of the jaw.

5. Place each wire into its own insertion area and actuate the machine's inserter switches. The machine will trim and insert the wires into the contacts, then will automatically index to the next connector position.
6. When the carriage and inserter assembly move to the front position, open the connector clamps and carefully remove the terminated connector.

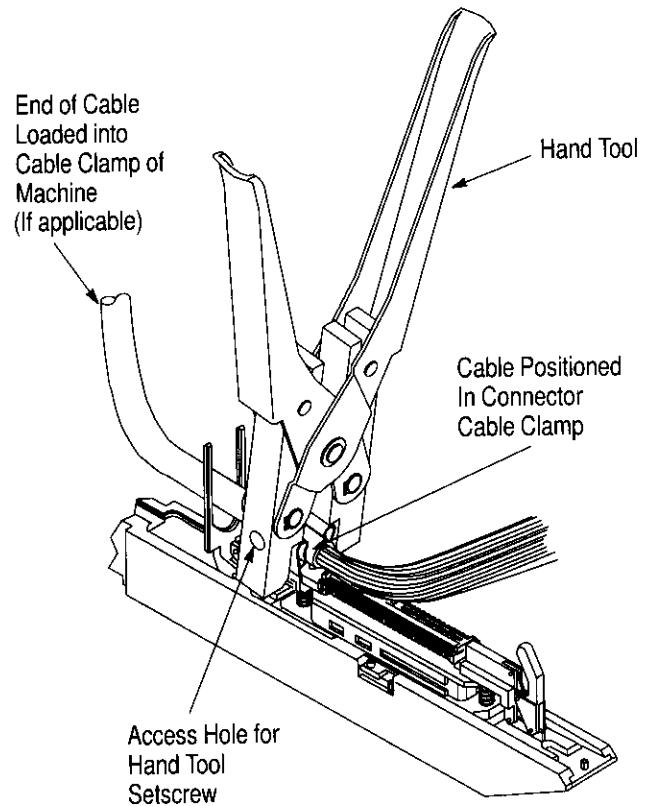


Figure 9

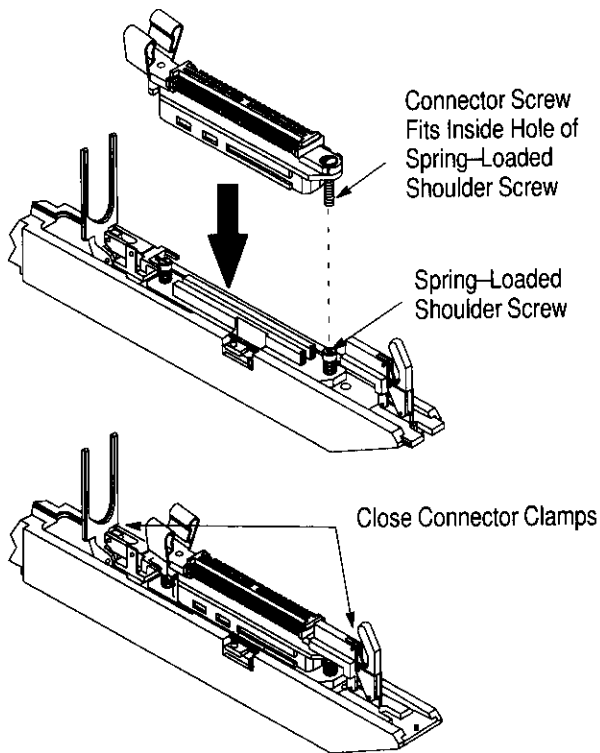


Figure 8

7. MAINTENANCE

7.1. Periodic Cleaning

Clean all debris and insulation buildup from the inserter assemblies.

7.2. Lubrication

Remove the cover plate and place a few drops of light oil onto the wire clamp slide. Cycle several times and wipe off excess oil before terminating wires.

7.3. Visual Inspection

1. Inserter tip – check for cracks, chips, or burrs. Remove or replace as necessary.
2. Guide block housing – check for burrs or gouges. Remove burrs.
3. Shear blade – check for chips or burrs. Replace as necessary.
4. Inserter mounting plate – check for cracks, specifically around the lower shear mounting slot. Replace as necessary.

8. REPLACEMENT PARTS

Figure 10 lists the items that are recommended as either expendable tooling or spare tooling. Expendable tooling, which includes items that are subject to wear, should be inspected regularly and replaced, if necessary.

Recommended spare tooling includes items that should be stocked to prevent machine downtime in the event that they become damaged.

For detailed information on the location of these items, and other replacement parts, refer to the drawings supplied in the tooling kit's documentation package.

PART NUMBER	DESCRIPTION
768902-1	Insertor Tip
852753-1	Spring (Modified)
856467-1	Lower Shear

Figure 10

9. TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Connector contacts being damaged.	Incorrect mandrel height.	Adjust height as described in this sheet.
	Insertor assembly out of adjustment.	Adjust insertor assembly as described in this sheet.
	Machine's offset not set correctly.	Adjust offset. Refer to the Customer Manual supplied with the machine.
	Damaged insertor tip.	Inspect/replace insertor.
Wire shear length varying.	Connector clamp too tight.	Adjust connector clamp force as described in this sheet.
	Insertor guide opening not properly set.	Adjust opening as described in this sheet.
	Wire clamp force not correct.	Adjust force as described in this sheet.
	Insertor assembly out of adjustment.	Adjust insertor assembly as described in this sheet.
Insulation extruded.	Damaged insertor tip or lower shear.	Inspect/replace insertor or shear as necessary.
	Wire clamp force too great.	Adjust force as described in this sheet.
Damage to wires above contact's wire insertion area.	Insertor guide opening not properly set.	Adjust opening as described in this sheet.
	Insertor assembly position too close to connector.	Adjust insertor assembly position as described in this sheet.
Wire not centered in contact's wire insertion area.	Cable breakout too low.	Raise position of cable (and wire breakout) on cable clamp.
	Insertor guide opening not properly set.	Adjust opening as described in this sheet.
	Machine's offset not set correctly.	Adjust offset. Refer to the Customer Manual supplied with the machine.
	Damaged insertor tip.	Inspect/replace insertor.
Wire strands cut.	Damaged connector clamps.	Inspect/replace connector clamps.
	Wire insertion too deep.	Adjust wire insertion depth as described in this sheet.
Wire falling out of contacts.	Wire insertion too short.	Adjust wire insertion depth as described in this sheet.
		Adjust insertor vane using the control module's Diagnostic Mode 3. Refer to the Customer Manual supplied with the module.
		Adjust machine offset. Refer to the Customer Manual supplied with the machine.