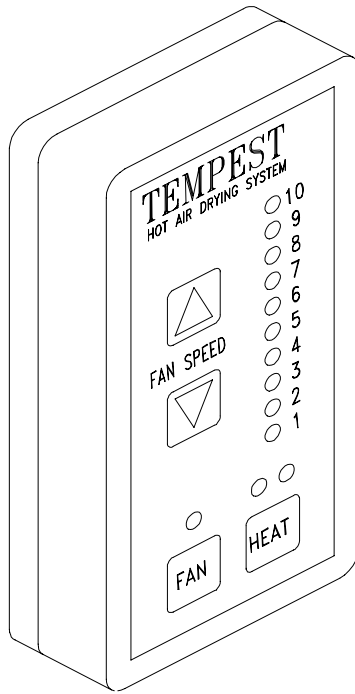


# Tempest® Hot Air Drying System

## Installation Instructions

Ryobi 3304



**ACCEL**  <sup>®</sup>  
Graphic Systems

# GENERAL INFORMATION

**ATTENTION  
TEMPEST®  
DRYER  
OWNER!**

Accel Graphic Systems provides parts and service through its authorized distributors and dealers. Therefore, all requests for parts and service should be directed to your local dealer.

The philosophy of Accel Graphic Systems is to continually improve all of its products. Written notices of changes and improvements are sent to Accel Graphic Systems' Dealers.

If the operating characteristics or the appearance of your product differs from those described in this manual, please contact your local Accel Graphic Systems Dealer for updated information and assistance.

Always update your equipment when improvements are made available, especially those related to safety.

**YOUR AUTHORIZED TEMPEST® DEALER IS:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**THE SERIAL NUMBER OF YOUR  
TEMPEST® HOT AIR DRYING SYSTEM IS:**

**CONTROL BOX** \_\_\_\_\_

**FAN UNIT** \_\_\_\_\_

**TECHNICAL  
ASSISTANCE**

For technical assistance during the installation, please contact:

**ACCEL GRAPHIC SYSTEMS**  
11103 Indian Trail  
Dallas, TX 75229  
PHONE (972) 484-6808  
FAX (800) 365-6510  
E-MAIL [accel@dallas.net](mailto:accel@dallas.net)  
WEB SITE [www.accelgraphicsystems.com](http://www.accelgraphicsystems.com)

## GENERAL INFORMATION

### ELECTRICAL REQUIREMENTS

220 VAC 50/60HZ  
20 AMP DEDICATED LINE  
NEMA L620R RECEPTACLE

### IMPORTANT INFORMATION

The use of heat to accelerate drying may require more frequent lubrication and/or use of a high temperature lubricant in the delivery of the press. Please consult your press manufacturer for specific recommendations.

### SAFETY INFORMATION

The Tempest Dryer® contains high voltage and hot surfaces. Never attempt to service or work on the unit unless the power is shut off and the unit is cool.

Visually inspect the thermistors (triangle-shaped objects arranged in a honeycombed pattern on the underside of the unit) weekly. If a thermistor is damaged or cracked, do not operate the dryer. Contact Accel immediately for a replacement part.

The fans should be turned on and set at the lowest speed ("0" on the dial when running just spray powder and no heat. This prevents spray powder from accumulating in the thermistors and housings.

### TERMINOLOGY

OPS = Operator's Side  
NOPS = Non Operator's Side

### TOOLS REQUIRED FOR INSTALLATION OF TEMPEST®

1. 3/32" Allen Wrench
2. 5/32" Allen Wrench
3. 3/16" Allen Wrench
4. 7/16" Open End Wrench
5. 3mm Allen Wrench
6. Phillips screwdriver

## GENERAL INFORMATION

### HOT AIR VS INFRARED WHAT MAKES TEMPEST® WORK

Although the technology behind the Tempest® dryer was significant enough to be awarded the GATF Intertech Award, it is by no means new. In fact, thermistors have been in use for many years. They were originally used in motors and other devices as a heat controller and later used in refrigeration to turn compressors on and off. It is only in the last 10 years or so that thermistors have been used as a heater.

Heat is generated by the thermistor because of the difficulty of electricity travelling through it when it is a conductor. The thermistor acts as a conductor until it reaches its set temperature and then it becomes a resistor. A thermistor is basically a ~~coated semiconductor designed to switch from a conductor to~~ a resistor at an established temperature.

When a current is applied to the thermistor it initially uses a large amount of electricity and heats up very quickly until it reaches its maximum set temperature. At this point it should not use any more electricity. However, air that is passed through the holes in the thermistor causes it to cool. This activates the thermistor to start using more power again so it can get back to its set temperature. The thermistor is constantly regenerating itself to stay at a constant temperature. This process is called autostabilization.

Thermistors are also the key element that makes the Tempest® dryer safe. Because the set temperature of the thermistor is lower than the flash point of paper, you can place even the most easily burned substrate, such as tissue paper, on top of the thermistor element without causing a fire. The tissue won't even char, let alone ignite. If you were to do the same with an IR element, a fire could be started in a matter of seconds. This is particularly important if a jam occurs in the delivery.

The objective of any drying system is to raise the pile temperature to accelerate the drying of the ink. However, heating the paper too much can aggravate problems such as blocking, setoff, mottle, loss of gloss, and loss of halftone definition. Too much heat can also cause the paper to shrink which can cause register problems in multiple pass work. The Tempest® dryer can keep the pile at a lower temperature than IR and still effectively set the ink film.

## GENERAL INFORMATION

IR dryers use very high temperatures and a fixed amount of electricity. One of the drawbacks of using a very hot heat source is that heat wants to travel from a very high temperature to a very low temperature. In other words, the heat generated from an IR dryer will travel to the press wall and attempt to increase its temperature because it is cooler than the heat produced by the IR dryer. Because the thermistors used in the Tempest® dryer use lower temperatures, the heated air has had time to cool by the time it reaches the wall of the press, reducing the chance of premature wear to press parts.

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### HOW DRYING IS ACCOMPLISHED WITH TEMPEST®

Tempest® "sets" the surface of the ink to prevent setoff from one sheet to another and to minimize the use of powder.

Tempest® accelerates the final drying of oil-based inks by raising the temperature of the delivery stack.

### KEY FACTORS TO REMEMBER ABOUT DRYERS FOR SMALL OFFSET PRESSES.

Do not expect a dryer to "instantly" dry the ink. Only UV inks and coatings dry instantly. The technology and hazards of such systems may make them cost prohibitive on small offset presses.

Some jobs may require spray powder. Because dryers for small offset presses do not dry ink instantly, powder will be required from time to time. However, you should expect to see a significant decrease in the amount of powder needed on a regular basis.

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Drying time is dependent upon the press speed, paper stock, ink coverage, type of ink, etc.

Do not expect a dryer to accelerate the drying of rubber-based inks. These inks dry by absorption into the stock, and heat does not accelerate this process.



## INSTALLATION

1

The installation of a Tempest® dryer in the Ryobi 3304 press also requires the installation of a PowderPro® spray system. The removal of the original powder spray nozzles and control box is necessary to install the Tempest® dryer. Install the PowderPro® before the Tempest® because the PowderPro® installation manual covers the removal of the original powder spray system.

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2

Disconnect the electrical power to the press.

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3

Remove the NOPS side covers necessary to access to the press electrical cabinet and where the powder spray hoses go through the press frame. Also, remove the NOPS delivery side cover.

7

Diagram A

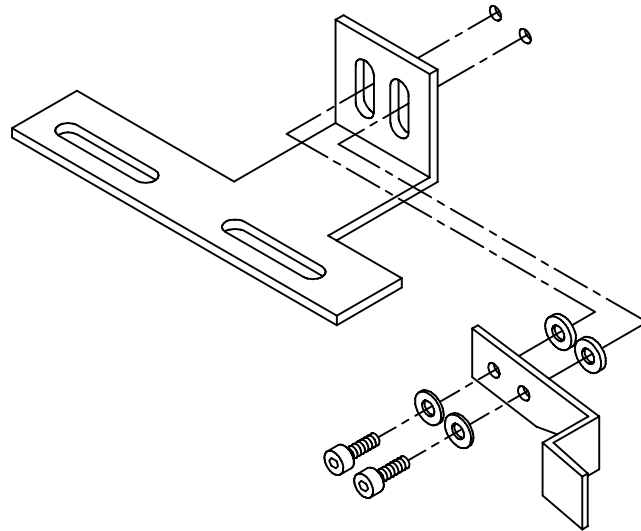
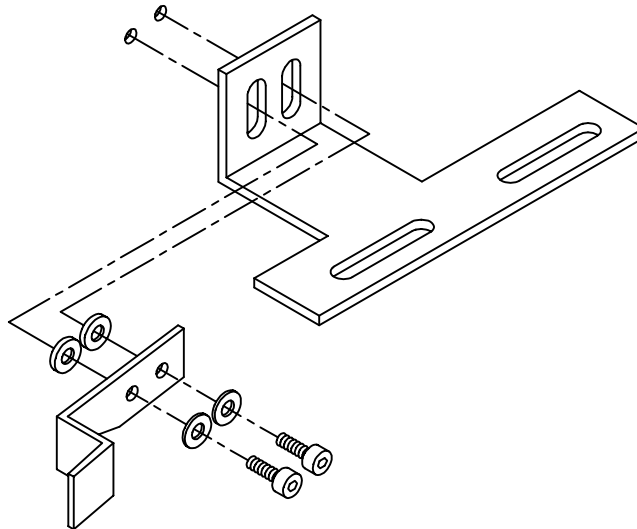


Diagram B



## INSTALLATION

**4**

Remove the OPS and NOPS chain guides that prevent the delivery pile lift chains from coming off of their sprockets.

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**5**

Using the provided hardware install the OPS Tempest mounting bracket and provided replacement chain guide to the press using the same threaded holes that held the original chain guide in place as shown in diagram A. Use the supplied thick black washers between the mounting bracket and chain guide so that the guide is properly aligned with the lift chain.

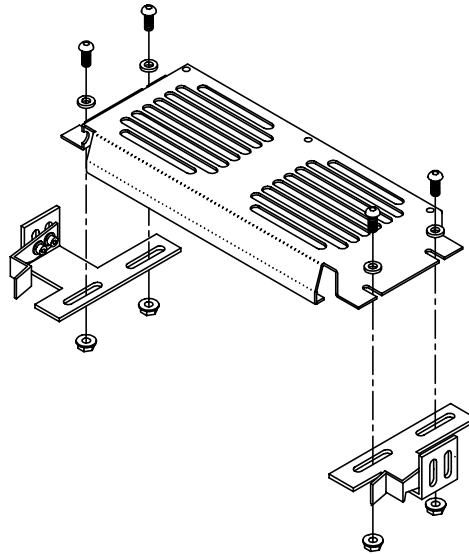
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**6**

Repeat the above procedure for the NOPS as shown in diagram B.

**9**

Diagram C



## INSTALLATION

7

Set the dryer on the mounting brackets with the cable exiting the dryer on the NOPS. Route the large black cable between the lower chain rail and the press frame, and through the rectangular hole in the press frame.

8

Secure the dryer to the mounting brackets using the provided hardware as shown in diagram C. Use the provided tie wraps to secure the cable as necessary to clear any moving parts in the delivery.

9

Briefly restore the power to the press. Carefully jog the press and check the clearance between the grippers as they pass both over and under the dryer. Adjust the height of the mounting brackets (the brackets are slotted to allow them to move up or down) as necessary for the dryer to clear the grippers. Disconnect the power to the press.

Diagram D

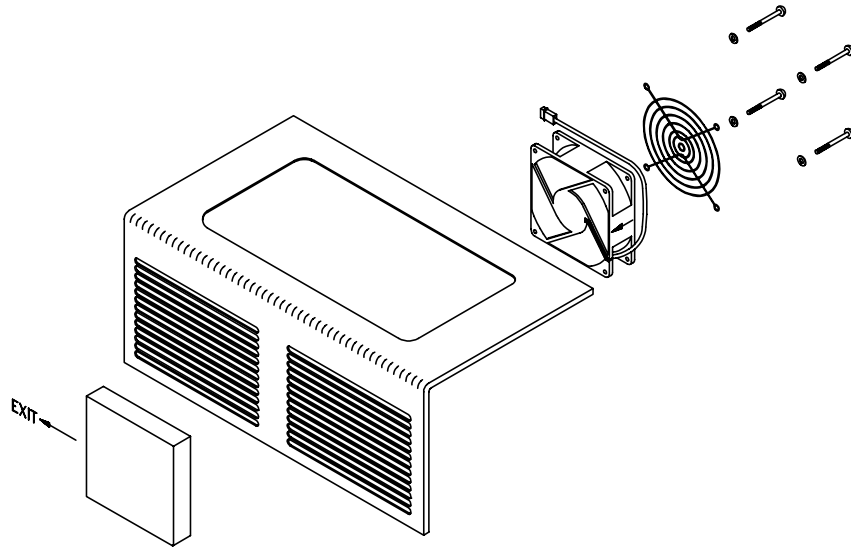
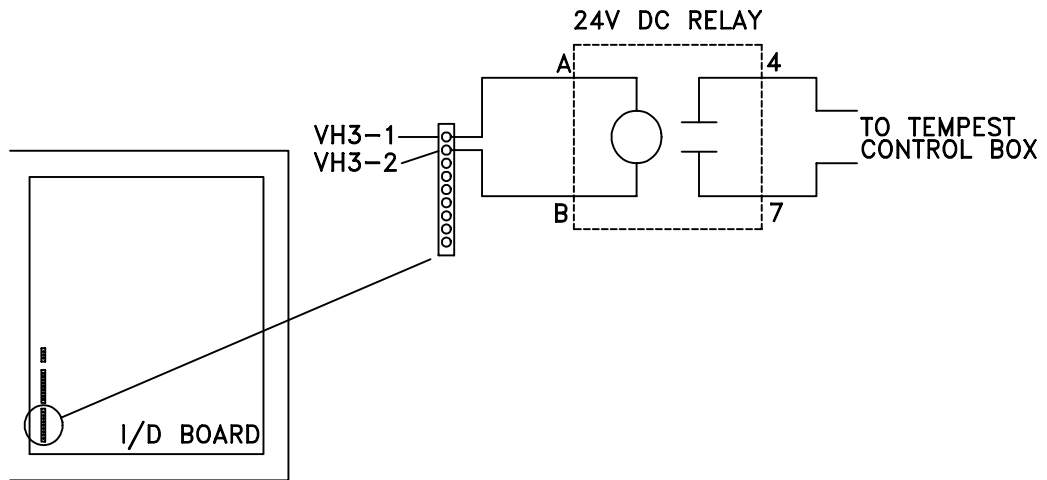


Diagram E



## INSTALLATION

**10**

Install the exhaust fan/manifold assembly to the center of the delivery guard as shown in diagram D. Make sure that the air flow directional arrow on the fan is pointing out of the press. Use the provided stick-on tie wrap mount to secure the fan cable up against the guard nearest to the NOPS.

**11**

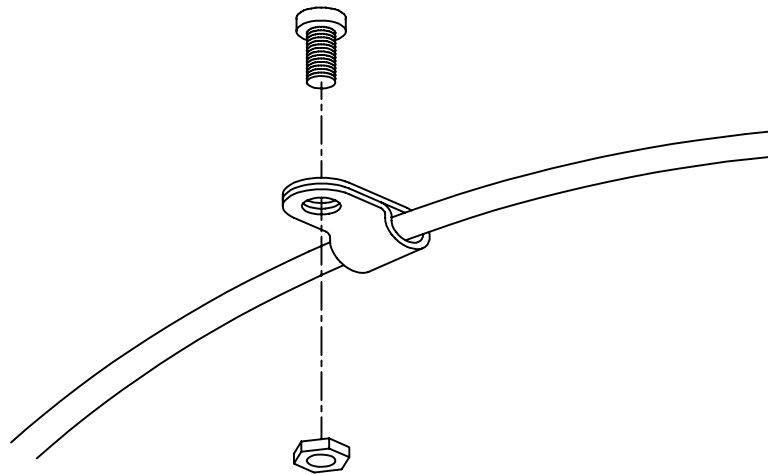
Find the suitable location for the main Tempest® electrical box on the NOPS of the press. Route the exhaust fan cable (this cable has female pins in the connector on the end) into the delivery and connect it to the exhaust fan installed in the previous step. Use the provided tie wraps to secure the cable as necessary to clear all moving parts in the delivery.

**12**

Route the impression signal cable into the press electrical cabinet on the NOPS. Connect the wires to position 4 & 7 on the provided 24VDC relay. If the press is already equipped with an Accel PowderPro® spray system it may already have this relay or a relay board installed. Attach the connector on the provided short cable assembly to positions VH3-1 and VH3-2 on the I/D board in the press electrical cabinet. The I/D board is on the far right side of the cabinet and the VH3 pin header is in the lower left corner of the board as shown in diagram E (pin one is the top pin). Connect the other end of the short cable assembly to positions A and B on the relay to the inside of the cabinet with the two-sided tape attached to the bottom of the relay. Use the provided tie wraps and/or the wire ducts in the cabinet to secure all loose cables.

**13**

Diagram F



## INSTALLATION

**13**

Remove the cover from the main Tempest® electrical box and insert the dryer cable through the strain relief on the bottom of the box. Remove the twelve position connector (only six positions are labeled) from the board and insert the wires into the connector by matching the numbered tags on the wires to the matching position on the connector. Secure the ground wire to the stud on the inside of the box. Replace the connector on the board and tighten the strain relief. Replace the cover on the box.

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**14**

Remove one of the two screws that attach the guard prop to the delivery guard on the NOPS. Install the supplied longer M4 screw in its place. Place the provided plastic cable clamp around the gray cable coming out of the dryer unit and secure the clamp to the longer prop screw using the original nut (see diagram F).

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**15**

Replace the blanket washer drip tray with the one provided. This replacement tray has extensions to it to act as a heat shield.

**15**



**16**

Use the provided zip-ties to secure all loose cables. See the back of this manual for a complete electrical system diagram.

Replace the covers on the press.

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## OPERATION & MAINTENANCE

### HOW DRYING IS ACCELERATED WITH TEMPEST®

Tempest® creates a two-step drying process when used with oil-based inks. These steps are:

1. Skinning the surface of the ink with the initial blast of hot air to prevent set-off .
2. Accelerating the final drying process approximately 20° F over the cold stack temperature in the feeder. Heat accelerates the drying process, called oxidation and reduction, of oil-based inks.

In general, dryers, including infrared, do not work well with rubber or acrylic-based inks. These inks should be avoided when maximum results are desired.

### HOW TEMPEST® WORKS

1. When voltage is applied to the thermistors (triangle-shaped objects arranged in a honeycomb pattern), the thermistors begin to heat. (Thermistors are coated semiconductors.)
2. Thermistors heat to a predetermined temperature, in this case about 400° F, and remain at that temperature. This is known as autostabilization.
3. The fans blow air down towards and through the thermistors, creating a flow of hot air to the sheet.
4. Drying of the ink occurs in the two-step process as described above.

No dryer totally eliminates the need for spray powder. There may be some jobs, for example a heavy solid on a high gloss sheet, where powder is required. Overall, Tempest® should reduce your spray powder usage significantly, leaving you with a better printed product and cleaner working environment.

## OPERATION & MAINTENANCE

### TEMPEST® OPERATION

#### NORMAL OPERATION

Pressing the HEAT switch will illuminate both the green and yellow LEDs on the remote control unit. The green LED indicates that the fans (both dryer and exhaust fans if so equipped) are running while the yellow LED indicates that the dryer is armed and the heat will come on automatically when the press goes on impression. When the press does go on impression, the red LED will illuminate indicating that the heat is on. Pressing the heat button again will disarm the heat mode but the fans will continue to run. To turn the unit OFF press the FAN switch at any time.

#### FAN ONLY OPERATION

To operate only the fans, press the FAN switch. The green LED will illuminate and the fans will come on (both the dryer and exhaust fans if so equipped). The heat mode of the dryer is not armed and will not come on with impression. To turn the fans OFF press the FAN switch again.

#### FAN SPEED CONTROL

To adjust the fan to a higher setting, press the up arrow on the remote control unit. To decrease the fan speed press the down arrow on the remote. The fans will automatically go to the minimum speed setting for a few seconds when the press goes on impression and then they return to the previous setting. This reduction in fan speed allows the dryer to heat up more quickly.

## OPERATION & MAINTENANCE

### INITIAL SETTINGS

Try running Tempest® with the fan speed at "4" with the switch on "HEAT." After about 1" of paper is stacked in the delivery, insert the thermometer into the center of the stack. Allow the thermometer to stabilize. It should be approximately 20° F over the initial paper temperature.

If the temperature is below that, **decrease the fan speed** slightly.

If the temperature is above that, **increase the fan speed** slightly.

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### FACTORS THAT EFFECT DRYING

1. Speed of the press.
2. Amount of ink coverage and color.
3. Type of stock being printed.

In time and with practice you will learn which settings are best for your particular shop.

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### KEYS TO REMEMBER

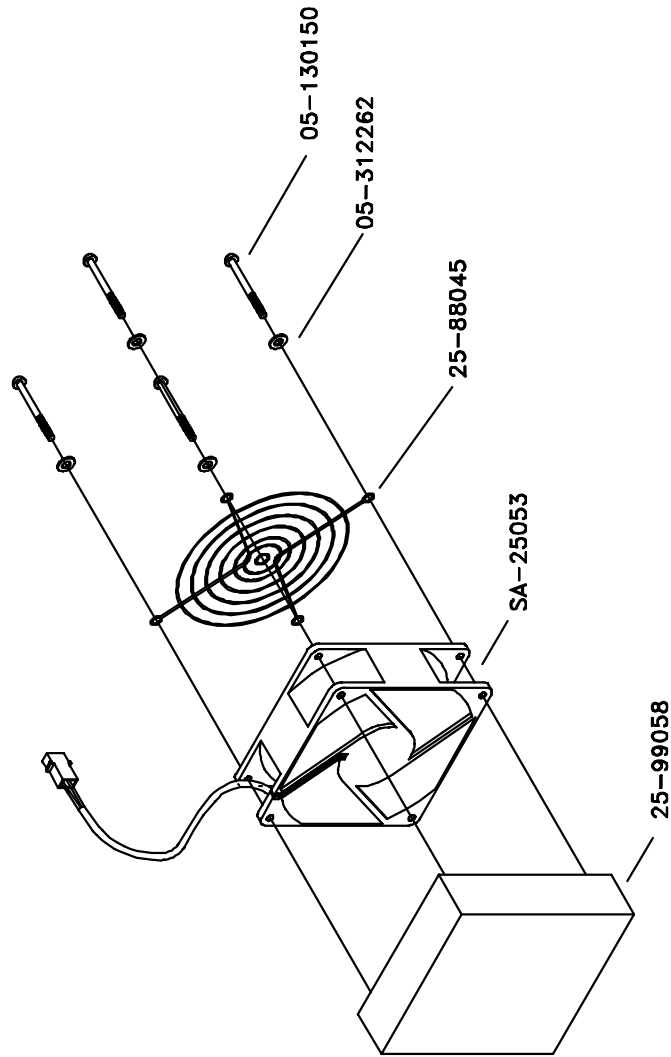
1. The Tempest® takes about 12 sheets to come up to full power. The dryer remains on as long as paper is being fed. It does not cycle like an infrared dryer.
2. The pile temperature should be approximately 20° F over initial paper temperature for optimum drying.
3. Use of spray powder only when absolutely necessary. A little spray powder goes a long way. Use it sparingly.
4. Inspect the Tempest® weekly.

## OPERATION & MAINTENANCE

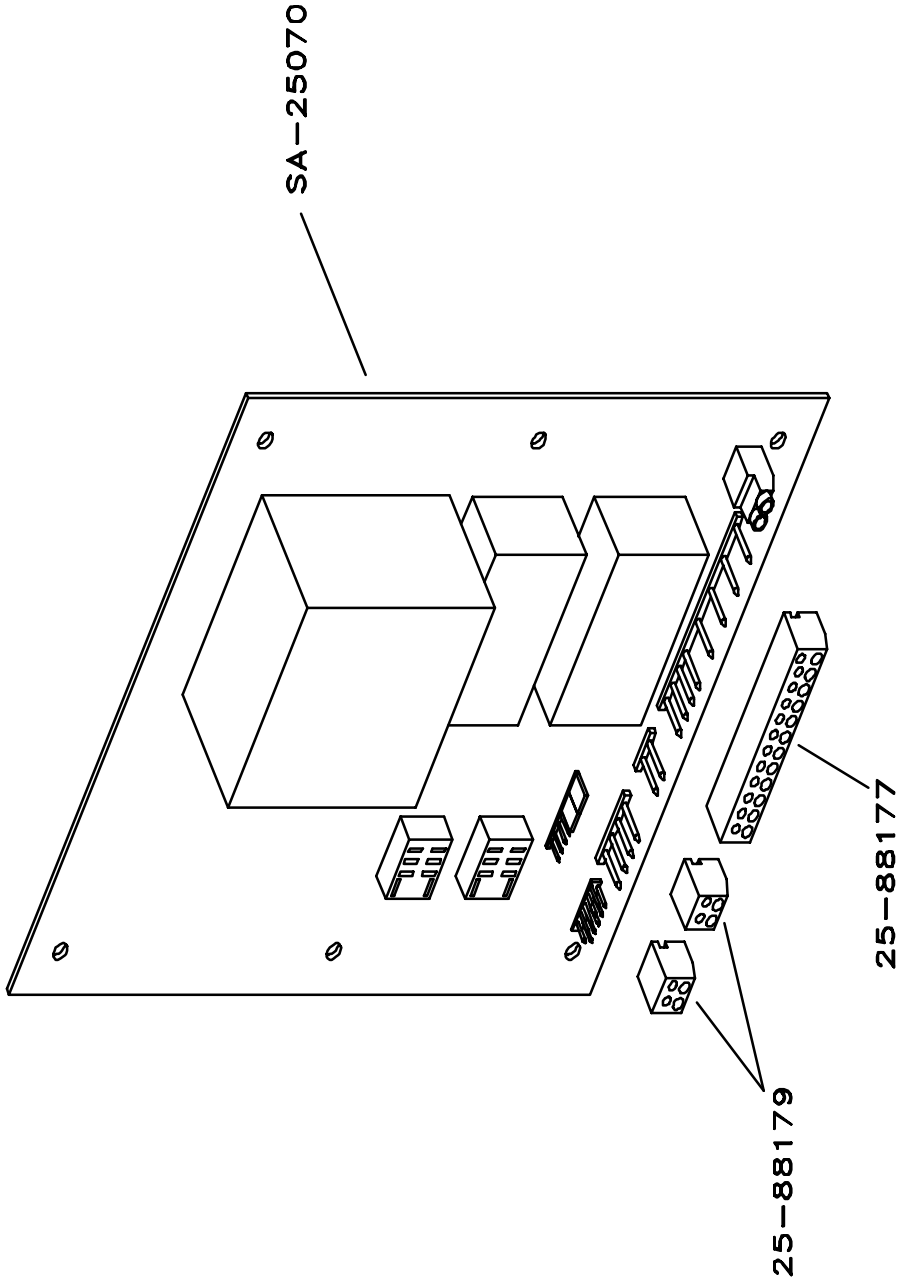
### MAINTENANCE

1. Inspect the dryer weekly. If the thermistors are cracked or have been damaged, do not operate the dryer. Call Accel immediately.
2. Never squirt cleaning solvents, water or any other liquids into the dryer. This may damage electrical components.
3. Any spray powder that accumulates in the dryer should be vacuumed out, not blown out.
4. Make sure all heat shields and guards are in place before operating the dryer or printing press.

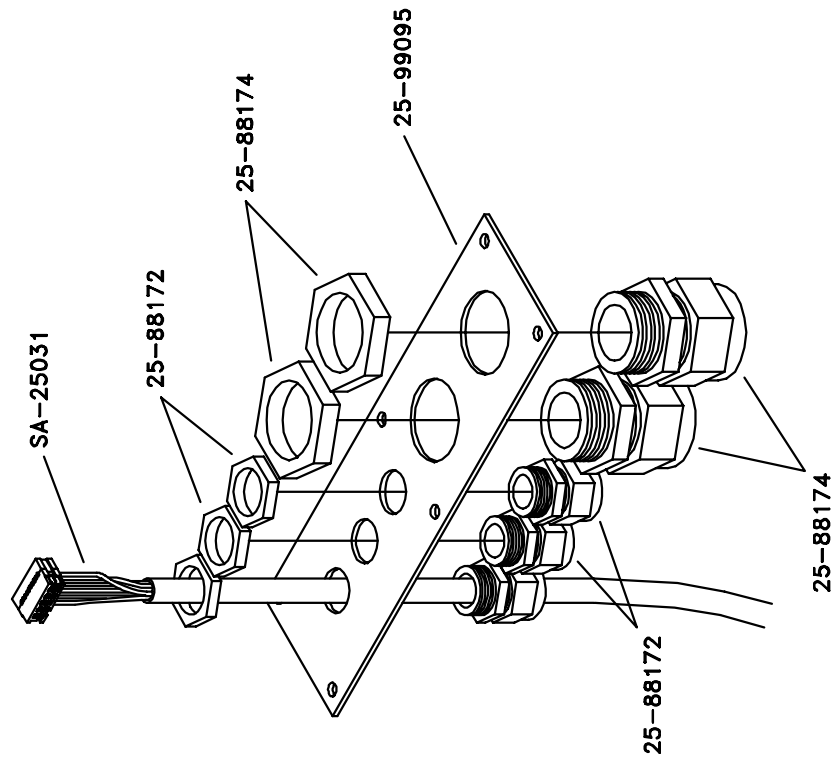




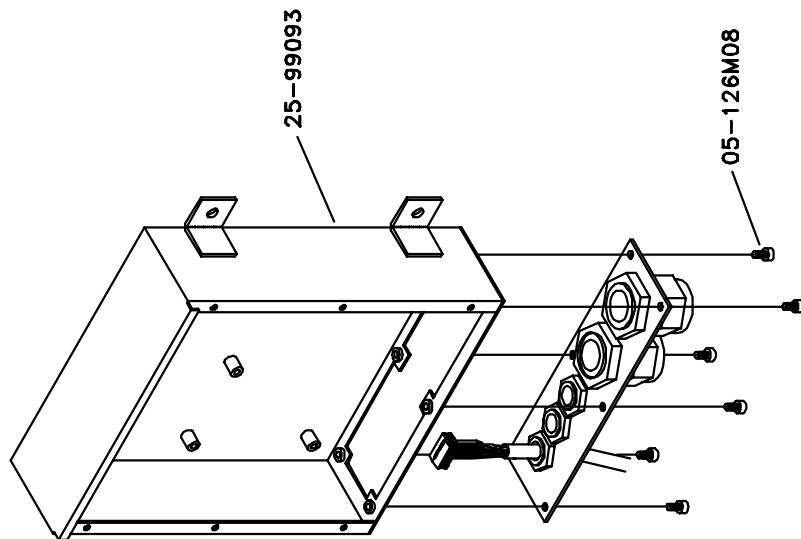
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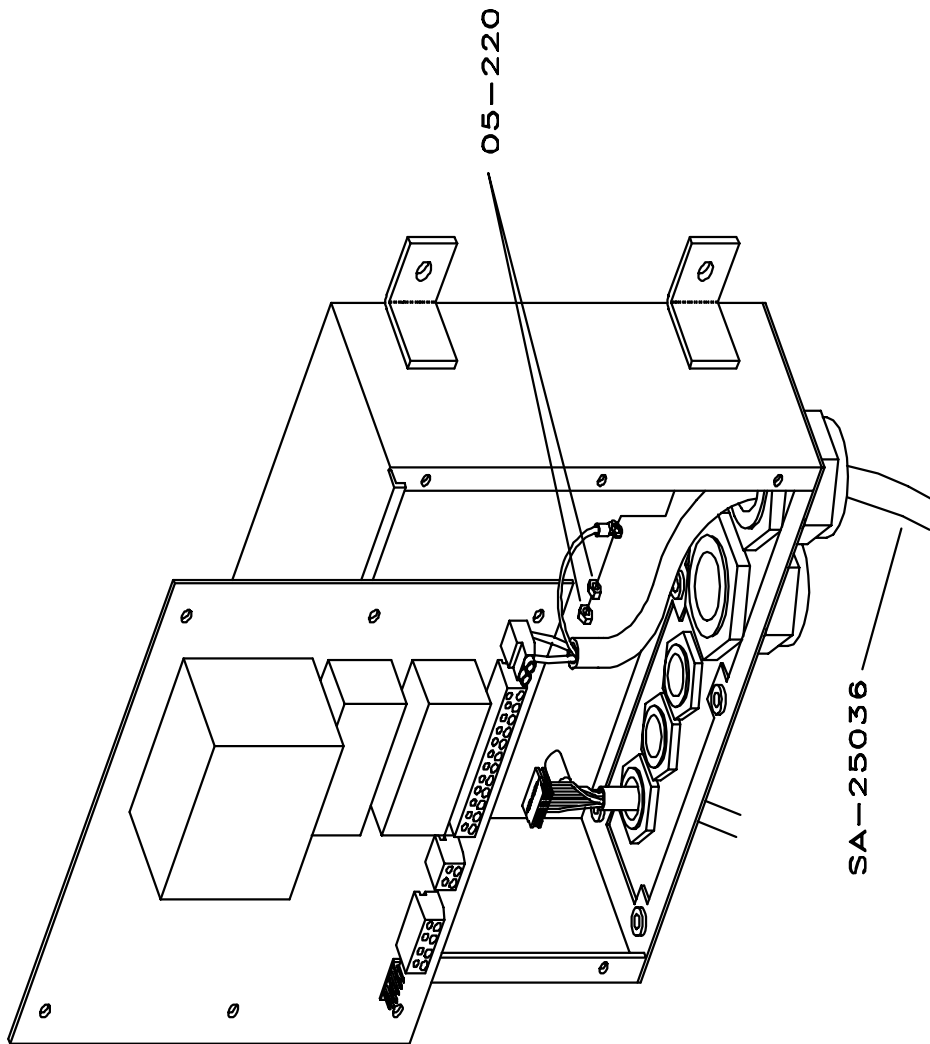
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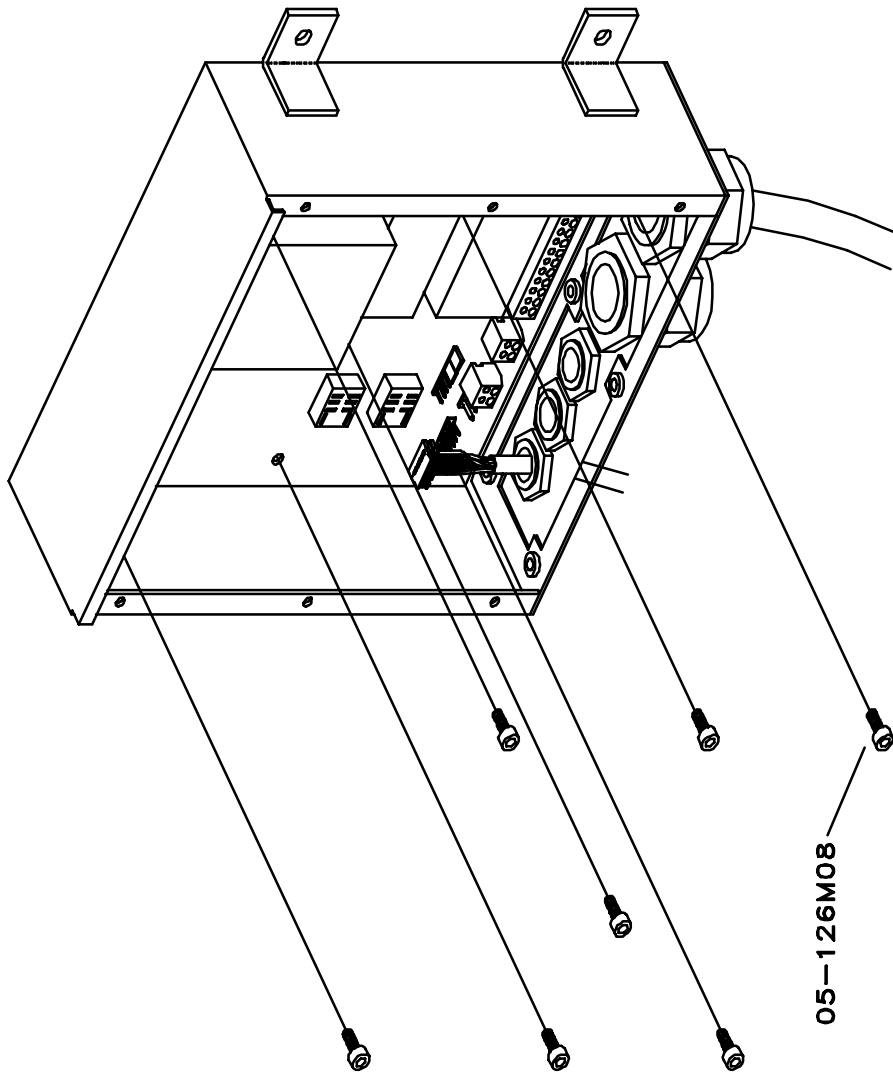
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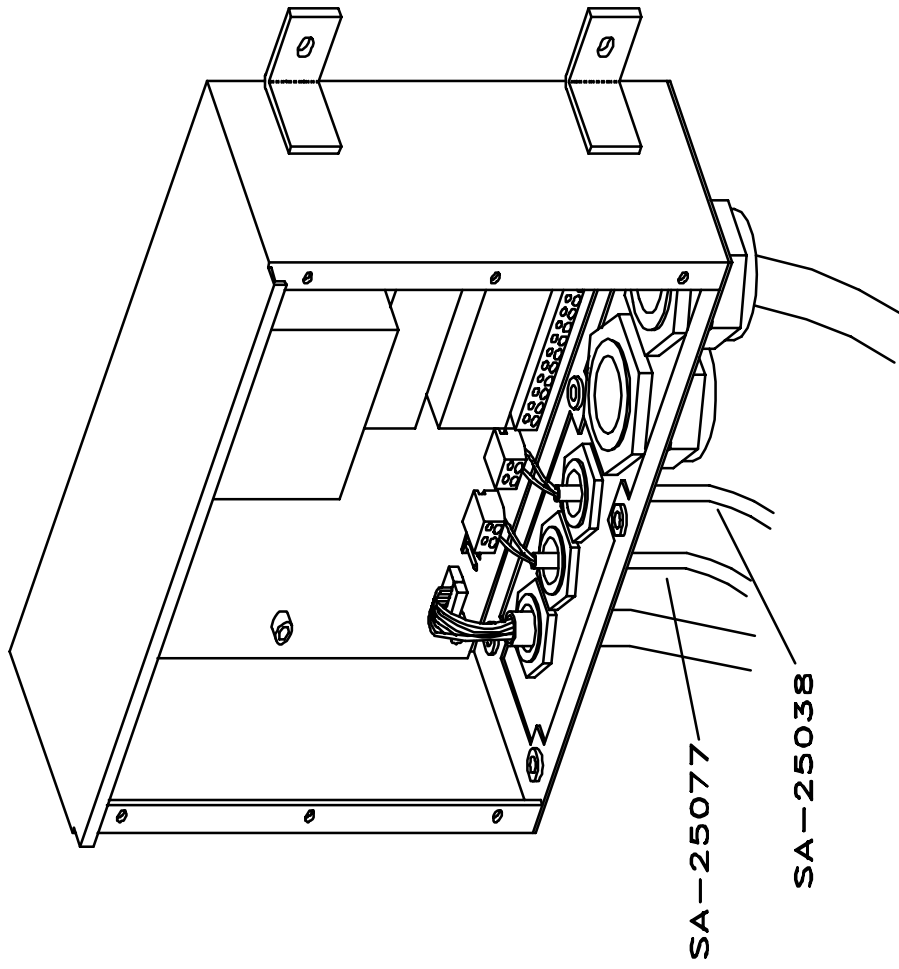


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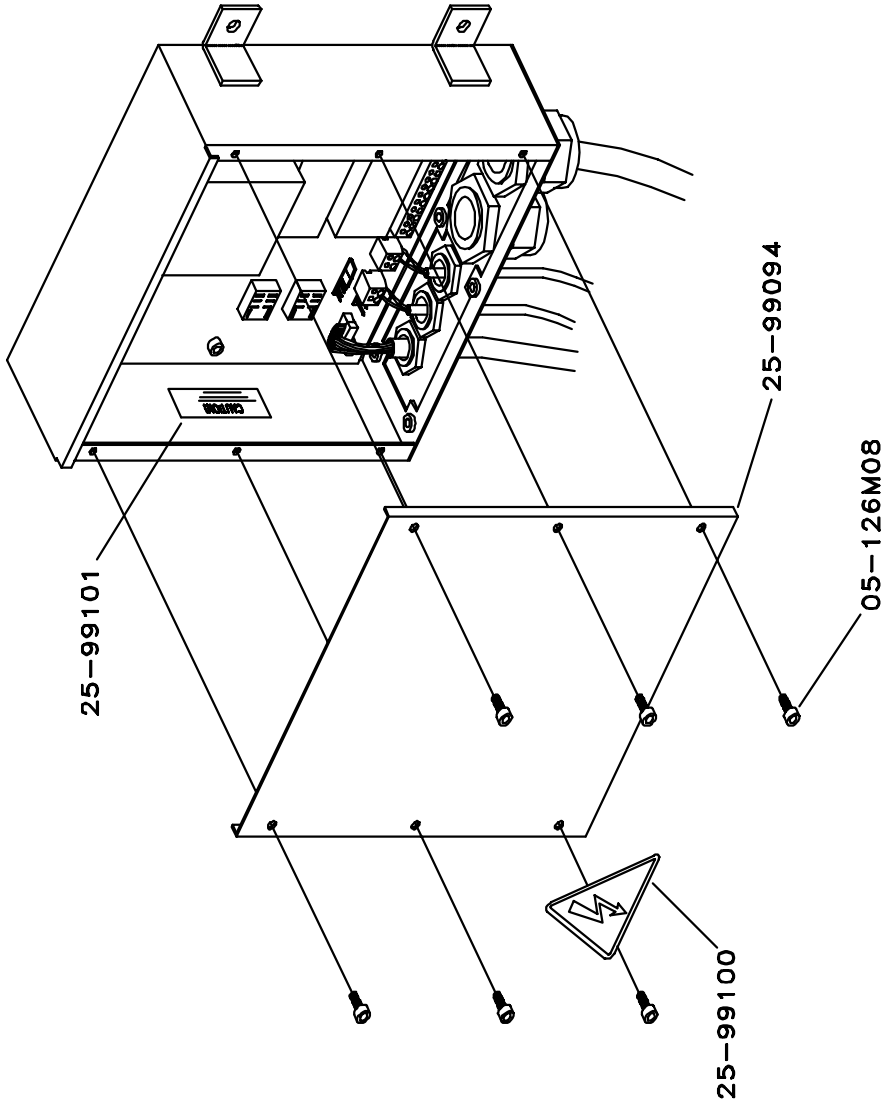


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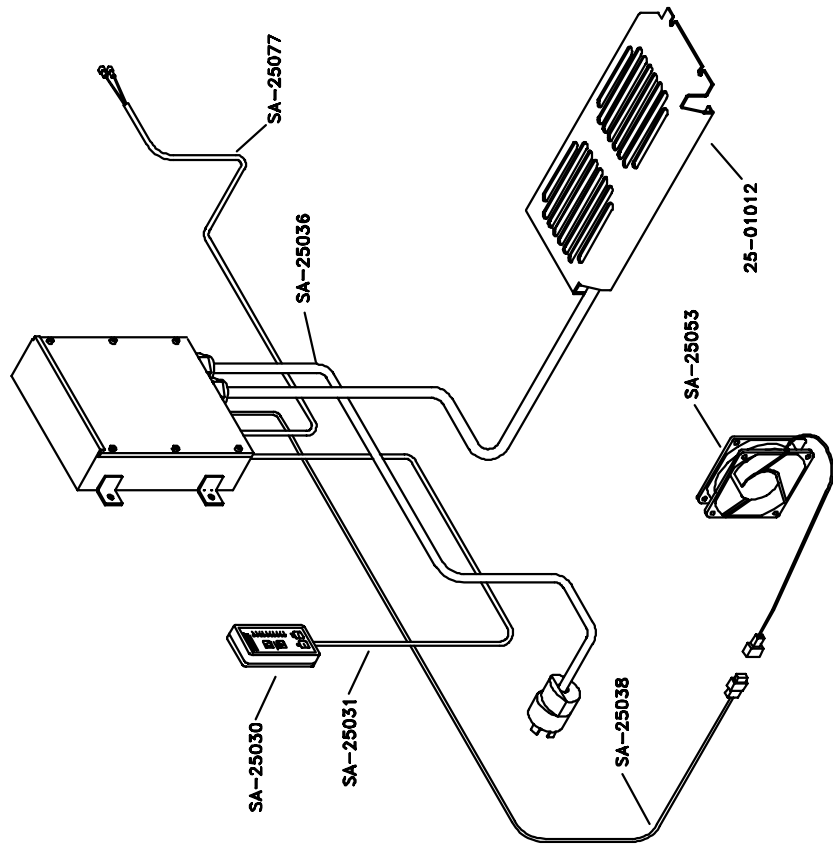
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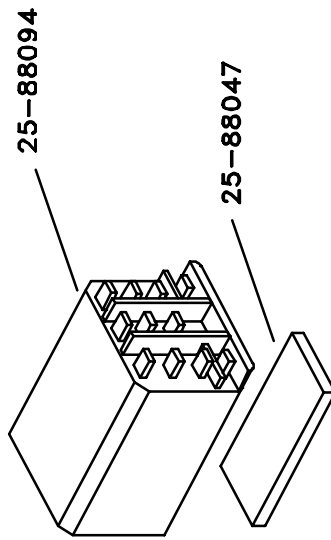
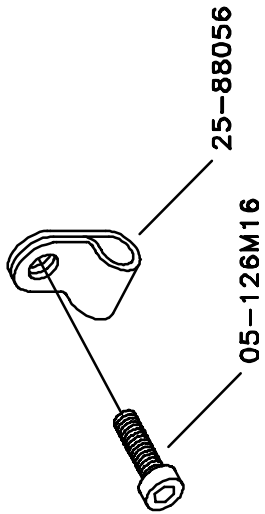
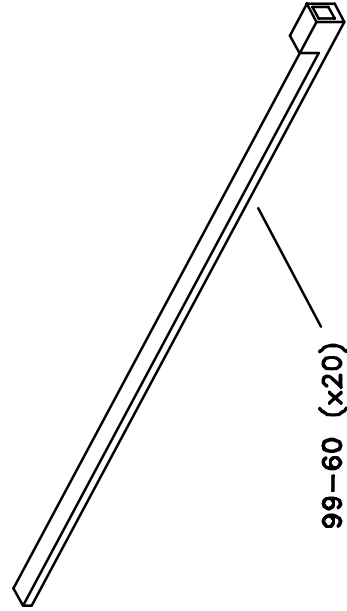
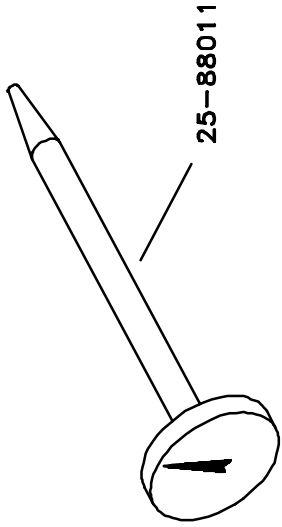
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3304T10, 7-9-97





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