

# Operator's Manual

**SECOR**  
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## Socket Fusion Tooling System

Manual: SW00401 Revision: A 01/02





# Introduction

ROT MFC



## Thank You for purchasing this McElroy product

The McElroy Socket Fusion Tooling System is designed for socket fusion on 1/2" CTS to 4" IPS pipe. All system components comply with ASTM standards.

With reasonable care and maintenance, these tools will give years of satisfactory service.

Before operating these tools, please read this manual thoroughly, and keep a copy with the tools for future reference. This manual is to be considered part of your Socket Fusion Tooling System.



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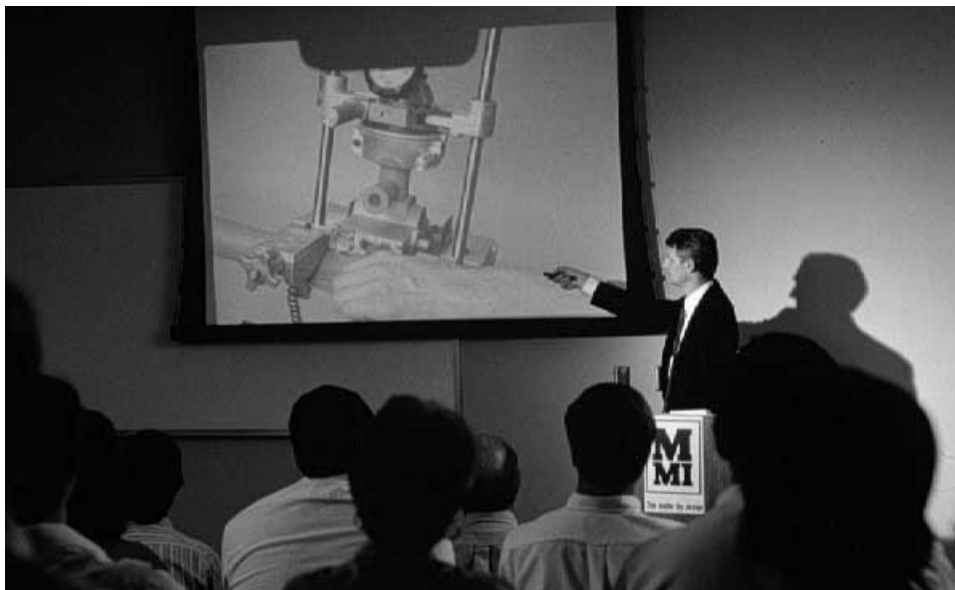
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## World Class Training

This manual is intended as a guide only and does not take the place of proper training by qualified instructors. The information in this manual is not all inclusive and can not encompass all possible situations that can be encountered during various operations.

McElroy Manufacturing, Inc., offers advanced training classes to enhance efficiency, productivity, safety and quality. Training is available at our facility or on-site at your location. Call (918) 836-8611

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# Warranty

ROY MFG



## LIMITED WARRANTY

McElroy Manufacturing, Inc. guarantees this product to the original purchaser against workmanship and material defects for **three (3) years** from date of shipment, with the exception of purchased items (such as electronic devices, pumps, switches, etc.), in which case that manufacturer's warranty applies. This warranty does not apply to any product or component which has been repaired or altered by anyone other than McElroy Manufacturing, Inc., or has become damaged due to misuse, negligence or casualty, or has not been operated or maintained according to McElroy Manufacturing, Inc.'s printed instructions and warnings.

Claims cannot be allowed until the questioned product has been received, freight prepaid, at the manufacturer's factory, with complete information and data regarding the failure. Materials returned to McElroy Manufacturing, Inc. for warranty work, repair, etc., **must have a Return Material Authorization (RMA) number**, and be so noted on the package at time of shipment. This number may be obtained by calling (918) 836-8611. If seller's review indicates that warranty applies, the defective product will be repaired or replaced and returned to purchaser F.O.B. Tulsa, Oklahoma.

McElroy Manufacturing, Inc. is not responsible or liable for loss of any sort including incidental and consequential damages.

McElroy Manufacturing, Inc. specifically disavows any other representations as to warranty or liability, related to the condition or use of the product.

For assistance, inquiries shall be directed to McElroy Manufacturing, Inc., P.O. Box 580550, 833 North Fulton, Tulsa, Oklahoma 74158-0550, (918) 836-8611, Fax No. (918) 831-9285

## DISCLAIMER OF LIABILITY

McElroy Manufacturing, Inc. accepts no responsibility of liability for fusion joints. Operation and maintenance of the product is the responsibility of others. We recommend qualified joining procedures be followed when using McElroy fusion equipment.

McELROY MAKES NO OTHER WARRANTY OF ANY KIND WHATEVER, EXPRESS OR IMPLIED; AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE AFORESTATED OBLIGATION ARE HEREBY DISCLAIMED BY McELROY.

## PRODUCT IMPROVEMENT

McElroy Manufacturing, Inc. reserves the right to make any changes in or improvements on its products without incurring any liability or obligation to update or change previously sold machines and/or the accessories thereto.

## TERMS AND CONDITIONS

Net 30 Days - Subject to credit approval. A carrying charge of 1-1/2% per month computed from invoice date will apply to invoices not paid within 30 Day Terms.

McElroy Manufacturing, Inc. must be notified of any discrepancy in shipment, order, and/or invoice within 10 days after receipt.

Freight is F.O.B. Tulsa, Oklahoma - usually motor freight collect or UPS unless otherwise specified.

Prices are subject to change without notice.

Minimum order is \$50.00.

**(Copy information listed on the Warranty Card for your records).**

Model No. \_\_\_\_\_


Serial No. \_\_\_\_\_

Date Received \_\_\_\_\_

Distributor \_\_\_\_\_



## Safety Alerts

This hazard alert sign  appears in this manual. When you see this sign, carefully read what it says. **YOUR SAFETY IS AT STAKE.**

You will see the hazard alert sign with these words: **DANGER**, **WARNING**, and **CAUTION**.



WR00051-1-1-30-92



Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury.



In this manual you should look for two other words: **NOTICE** and **IMPORTANT**.

**NOTICE:** can keep you from doing something that might damage the machine or someone's property. It may also be used to alert against unsafe practices.

**IMPORTANT:** can help you do a better job or make your job easier in some way.

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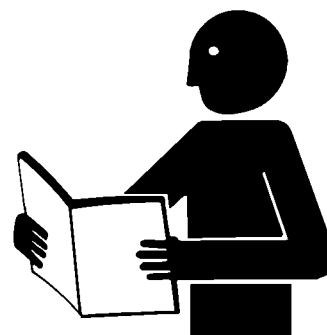
## Read and Understand

Do not operate this equipment until you have carefully read, and understand the "Safety" and "Operation" sections of this manual, and all other equipment manuals that will be used with it.

Your safety and the safety of others depends upon care and judgment in the operation of this equipment.

Follow all applicable federal, state, local, and industry specific regulations.

McElroy Manufacturing, Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine are therefore not all inclusive. You must satisfy yourself that a procedure, tool, work method, or operating technique is safe for you and others. You should also ensure that the machine will not be damaged or made unsafe by the method of operation or maintenance you choose.



WR00052-12-1-92

TX00031-12-8-92



# Fusion Equipment Safety



ROY MFC

## General Safety

Safety is important. Report anything unusual that you notice during set up or operation.

**LISTEN** for thumps, bumps, rattles, squeals, air leaks, or unusual sounds.

**SMELL** odors like burning insulation, hot metal, burning rubber, hot oil, or natural gas.

**FEEL** any changes in the way the equipment operates.

**SEE** problems with wiring and cables, hydraulic connections, or other equipment.

**REPORT** anything you see, feel, smell, or hear that is different from what you expect, or that you think may be unsafe.



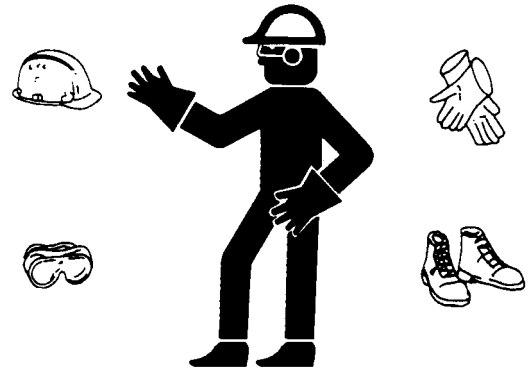
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## Wear Safety Equipment

Wear a hard hat, safety shoes, safety glasses, and other applicable personal protective equipment.

Remove jewelry and rings, and do not wear loose-fitting clothing or long hair that could catch on controls or moving machinery.



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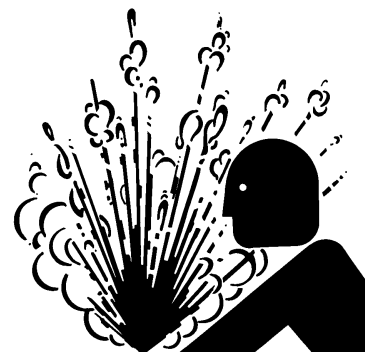
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## Heater Is Not Explosion Proof



This heater is not explosion proof. Operation of heater in a hazardous environment without necessary safety precautions will result in explosion and death.

If operating in a hazardous environment, the heater should be brought up to temperature in a safe environment, then **unplugged before entering** the hazardous atmosphere for fusion.



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## Electrical Safety



Always ensure power cords are properly grounded. It is important to remember that you are working in a wet environment with electrical devices. Proper ground connections help to minimize the chances of an electric shock.

Frequently inspect electrical cords and unit for damage. Have damaged components replaced and service performed by a qualified electrician.

Do not carry electrical devices by the cord.

**NOTICE:** Always connect units to the proper power source as listed on the unit, or in the owner's manual. On units with two power cords, plug each cord into separate power circuits. Do not plug into both outlets of one duplex receptacle.

**NOTICE:** Disconnect the machine from the power source before attempting any maintenance or adjustment.



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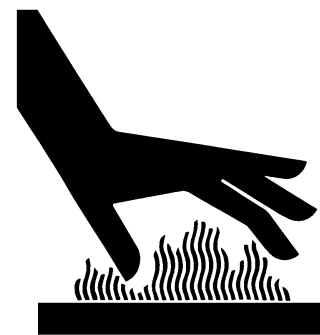
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## Heater is Hot



The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand or blanket when not in use, and use care when heating the pipe.

**NOTICE:** Use only a clean non-synthetic cloth such as a cotton cloth to clean the heater plates.



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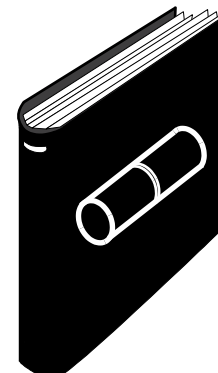
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## Fusion Procedures

Obtain a copy of the pipe manufacturer's procedures for the pipe being fused. Follow the procedure carefully, and adhere to all specified parameters.



Failure to follow pipe manufacturer's procedure could result in a bad joint. Always follow pipe manufacturer's procedures.



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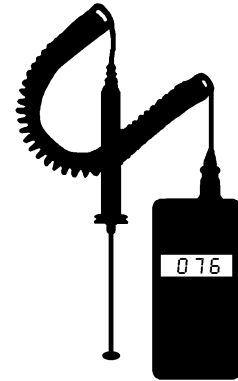
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## Periodically Check Temperature

**NOTICE:** Incorrect heating temperature can result in bad fusion joints. Check heater plate surface temperature periodically with a properly calibrated pyrometer, and make necessary adjustments.

The thermometer on heaters indicates internal temperature, and should be used as a reference only.



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## Theory of Heat Fusion

The principle of heat fusion is to heat two surfaces to a designated temperature, and then fuse them together by application of force. This pressure causes flow of the melted materials, which causes mixing and thus fusion. When the polyethylene material is heated, the molecular structure is transformed from a crystalline state into an amorphous condition. When fusion pressure is applied, the molecules from each Polyethylene part mix. As the joint cools, the molecules return to their crystalline form, the original interfaces are gone, and the fitting and pipe have become one homogeneous unit. The joint area becomes as strong as the pipe itself in both tensile and pressure conditions.



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The principle operations include:

- Clamping** The pipe and fitting must be held firmly to allow all subsequent operations to take place.
- Cleaning** The area of pipe that the fitting will come in contact with must be cleaned, as well as the base of the fitting.
- Alignment** The fitting must be properly seated on the pipe for proper alignment.
- Heating** A melt pattern must be formed that penetrates into the pipe and into the fitting.
- Joining** The melt patterns must be joined with pressure. The pressure must be constant around the interface area.
- Holding** The molten joint must be held immobile until adequately cooled.

Each pipe manufacturer has a slightly different approach for fulfilling the heating, joining, and holding phases, but the end result is the same – a fusion joint that is as strong or stronger than the pipe itself.



## Nomenclature

- ① Heater Sling
- ② Heater
- ③ Chamfer Tool/Depth Gauge
- ④ Heater Adapters
- ⑤ Pipe Cutter
- ⑥ Clean Cloth
- ⑦ Fitting Holder
- ⑧ Cold Ring Clamp

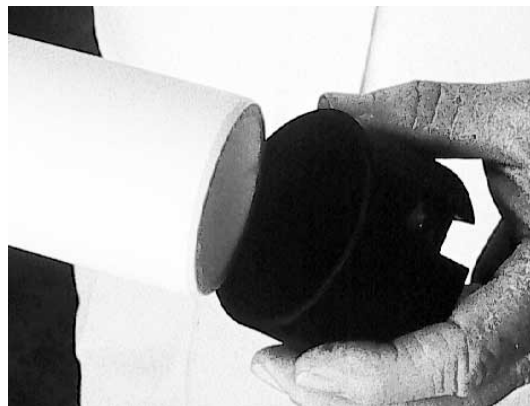


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## Prepare Pipe End

Cut off damaged or oval ends of pipe squarely with a pipe cutter.  
Place the chamfering tool on end of pipe and turn to cut off sharp edge on top end of pipe.  
Remove shavings and burrs inside pipe end.

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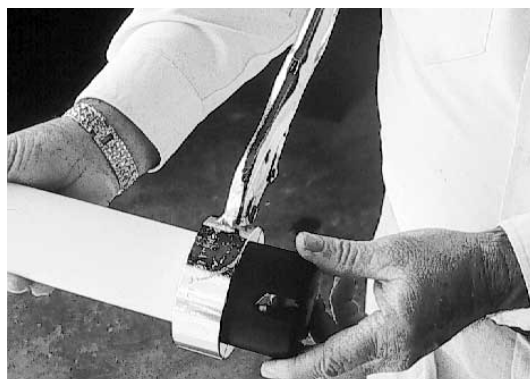


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## Depth Gauge

The chamfering tool is also a depth gauge for measuring the length of pipe that will go into the fitting.  
Place chamfering tool on end of pipe.  
Place cold ring clamp on pipe at the bottom of the chamfering tool.  
Remove chamfering tool.

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## Secure 2" and Larger Fittings

Place fitting in socket fitting holder.  
Tighten socket fitting holder around fitting.

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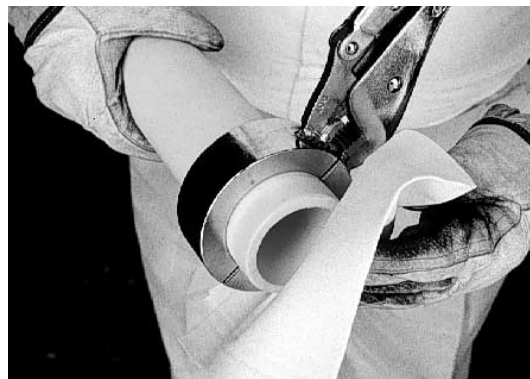
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## Clean Fitting and Pipe

Fitting and pipe must be clean and dry. Use a clean cloth to wipe the mating surfaces.

**NOTICE:** Do not touch with hands.

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## Heater Is Not Explosion Proof

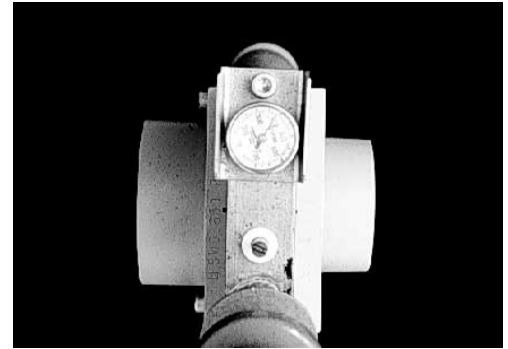


This heater is not explosion proof. Operation of heater in a hazardous environment without necessary safety precautions will result in explosion and death.

If operating in a hazardous environment, the heater should be brought up to temperature in a safe environment, then unplugged before entering the hazardous atmosphere for fusion.

Use a clean non-synthetic cloth to clean the heater adapter surfaces.

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## Heater Temperature

The socket faces of the heater must be at the temperature specified by the pipe manufacturer.

Use a pyrometer to check the temperature on the socket faces.

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## Heating The Pipe and Fitting

Firmly seat the socket fitting on the male adapter of the heater.

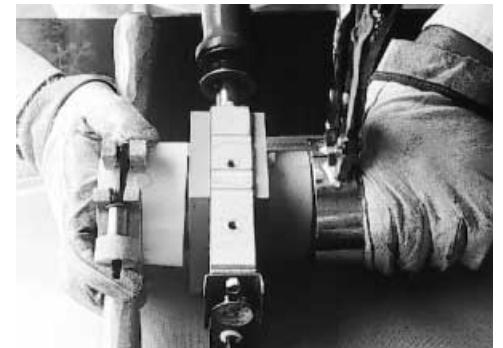
Place the female adapter of the heater over the end of the pipe, firmly against the cold ring clamp.

Heating time starts when the heater is bottomed out on the cold ring clamp.

Heat fitting and pipe for the pipe manufacturer's specified period of time.

**NOTICE:** Do not twist fitting, pipe or heater

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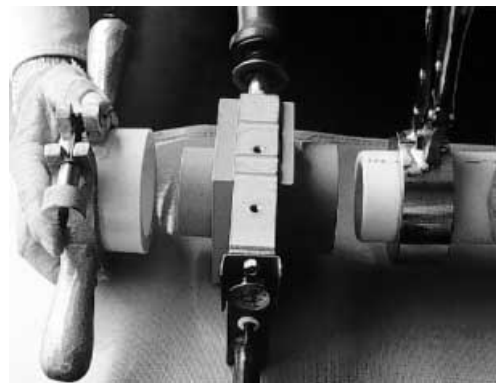
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## Remove Heater

Snap the heater and fitting from the pipe by holding upper part of heater handle with one hand and rapping sharply on the handle with the other hand.

Immediately remove fitting from heater.

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## Inspect Melt

Quickly inspect the heated parts to make sure all surfaces have been melted properly.

If melt is not complete, cut off melted pipe end. Use a new fitting and repeat preparation and heating process over again.

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## Fusion and Cooling

Within 3 seconds after the heater has been removed, firmly push the melted fitting squarely onto the pipe until it makes firm contact with the cold ring clamp.

**NOTICE:** Do not twist or rotate the fitting.

Hold the fitting firmly in place for the total cooling time specified by the pipe manufacturer to ensure proper alignment.

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## Inspecting Fusion Joint

After completing the pipe manufacturer's specified cooling and waiting time, remove the cold ring clamp and the socket fitting holder.

Inspect the joint. A good joint will have a uniform melt ring that is flat against the socket fitting and perpendicular to the pipe.

There should be no gaps or voids between the fitting and the pipe.

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## Installing Socket Fusion Heater Adapters

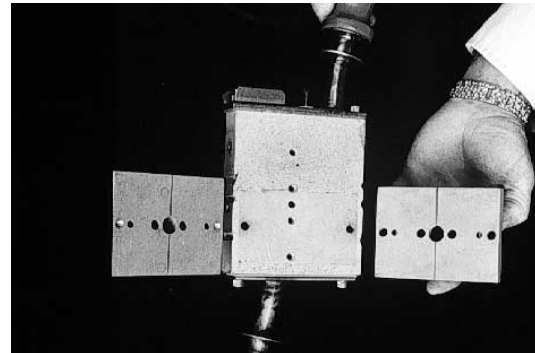
The heater body of this assembly is not coated. Coated heater adapters are available for all fusion applications.

Heater adapters are installed with Stainless Steel Cap Screws.

Care should be taken to assure that the heater adapters are seated on the heater body, and that there is no foreign matter trapped between these surfaces.

**IMPORTANT:** Do not over-tighten the bolts.

The surface of the heater adapters are coated with an anti-stick coating.



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## Clean Heater Surfaces

The heater adapters must be kept clean and free of any plastic build-up or contamination.

Before and after each fusion is made, the surface of the heater adapters must be wiped with a clean, non-synthetic cloth.



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## Adjusting Heater Temperature

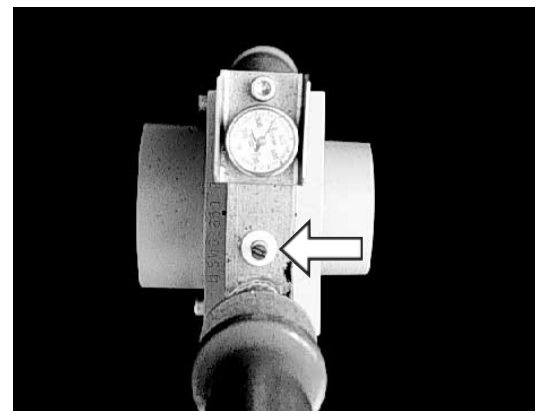
**CAUTION** Incorrect adjustment can result in injury as well as machine damage. Follow these instructions carefully.

The heater thermoswitch adjustment shaft protrudes through the heater handle base.

Turn the adjustment shaft clockwise to lower temperature, counterclockwise to raise temperature.

Allow sufficient amount of time for unit to stabilize at the new temperature (5 to 10 minutes) after each adjustment.

One full turn equals approximately 100° F.



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