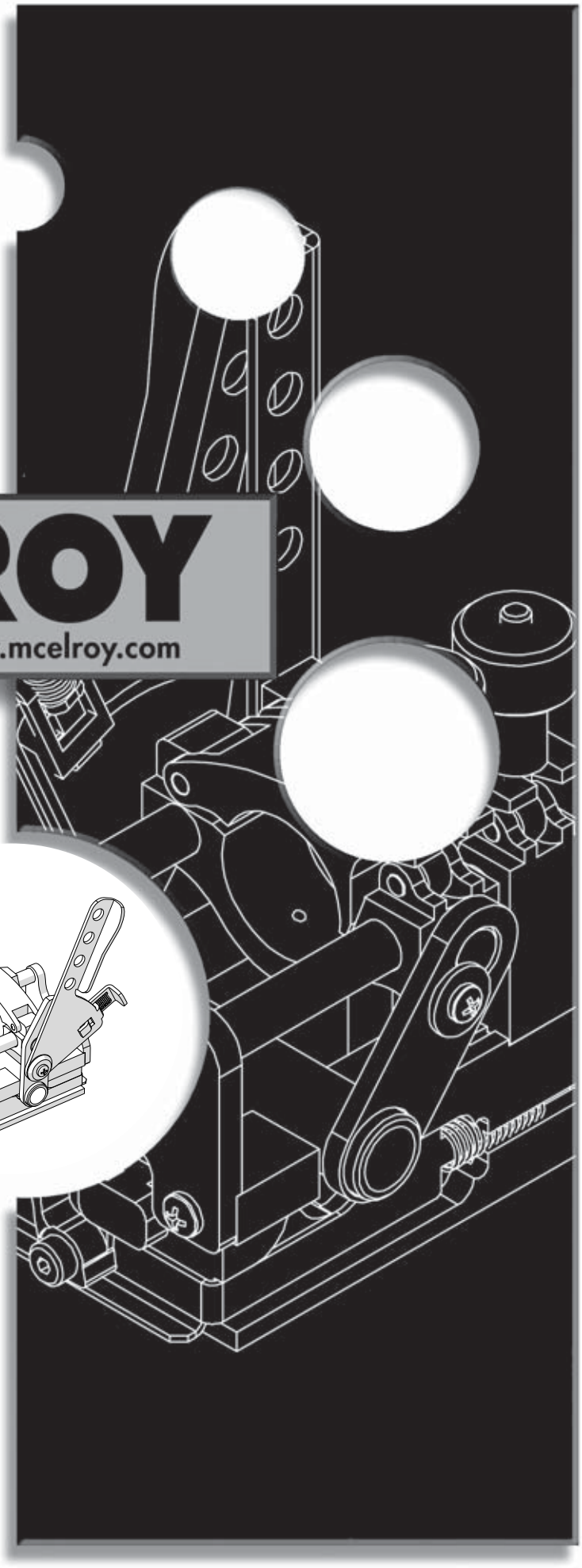
Operator's Manual



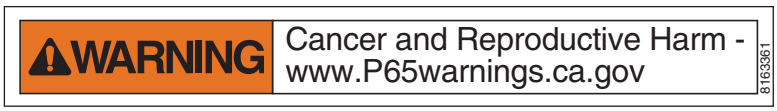
McELROY

www.mcelroy.com

1LC

Fusion Machine

Manual: CTS15901 Revision: C 12/18
Original Language: English



This product and other products could be protected by patents or have patents pending. All the latest patent information is available at patent.mcelroy.com

Introduction

Thank You for purchasing this McElroy product

The 1LC fusion machine is small and compact, and offers the benefit of McElroy's Patented Centerline Guidance System previously offered only in larger machines. The 1LC butt fuses 1/2" CTS to 1" IPS (16mm - 34mm) polyethlene pipe.

If fusing other thermoplastic pipe materials, refer to the pipe manufacturer's fusion procedures or appropriate joining standard.

With reasonable care and maintenance, this machine will give years of satisfactory service.

Before operating this machine, please read this manual thoroughly, and keep a copy with the machine for future reference. This manual is to be considered part of your machine.

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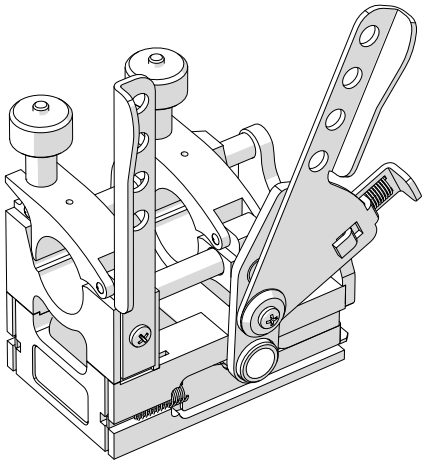

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McElroy University

For more than 30 years, McElroy has been the only pipe fusion machine manufacturer to continuously offer advanced training. Course offerings are meant to enhance your efficiency, productivity and safety in the proper use of McElroy machines. McElroy University classes are structured so that the skills learned and the machines used in each class closely match the machines found on pipelining jobsites. We offer training at our facility or yours. Our uniquely qualified McElroy University course instructors offer years of industry experience.

Tuition for each course includes lunches, course materials and a certificate of completion. Online registration, as well as up-to-date course offerings and dates, is available at **www.mcelroy.com/university**

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.

SINCE 1981
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UNIVERSITY℠

MU2-03-13-14

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Warranty

LIMITED WARRANTY

McElroy Manufacturing, Inc. (McElroy) warrants all products manufactured, sold and repaired by it to be free from defects in materials and workmanship, its obligation under this warranty being limited to repairing or replacing at its factory and new products, within **5 years** after shipment, with the exception of purchased items (such as electronic devices, pumps, switches, etc.), in which case that manufacturer's warranty applies. Warranty applies when returned freight is prepaid and which, upon examination, shall disclose to have been defective. This warranty does not apply to any product or component which has been repaired or altered by anyone other than McElroy or has become damaged due to misuse, negligence or casualty, or has not been operated or maintained according to McElroy's printed instructions and warnings. This warranty is expressly in lieu of all other warranties expressed or implied. The remedies of the Buyer are the exclusive and sole remedies available and Buyer shall not be entitled to receive any incidental or consequential damages. Buyer waives the benefit of any rule that disclaimer of warranty shall be construed against McElroy and agrees that such disclaimers herein shall be construed liberally in favor of McElroy.

RETURN OF GOODS

Buyer agrees not to return goods for any reason except upon the written consent of McElroy obtained in advance of such return, which consent, if given, shall specify the terms and conditions and charges upon which any such return may be made. Materials returned to McElroy, for warranty work, repair, etc., **must have a Return Material Authorization (RMA) number**, and be so noted on the package at time of shipment. For assistance, inquiry shall be directed to:

McElroy Manufacturing, Inc.
P.O. Box 580550
833 North Fulton Street Tulsa, Oklahoma 74158-0550

PHONE: (918) 836–8611, FAX: (918) 831–9285.
EMAIL: fusion@McElroy.com

Note: Certain repairs, warranty work, and inquiries may be directed, at McElroy's discretion, to an authorized service center or distributor.

TX02486-11-4-13

DISCLAIMER OF LIABILITY

McElroy 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 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.

INFORMATION DISCLOSED

No information of knowledge heretofore or hereafter disclosed to McElroy in the performance of or in connection with the terms hereof, shall be deemed to be confidential or proprietary, unless otherwise expressly agreed to in writing by McElroy and any such information or knowledge shall be free from restrictions, other than a claim for patent infringement, is part of the consideration hereof.

PROPRIETARY RIGHTS

All proprietary rights pertaining to the equipment or the components of the equipment to be delivered by McElroy hereunder, and all patent rights therein, arising prior to, or in the course of, or as a result of the design or fabrication of the said product, are exclusively the property of McElroy.

LAW APPLICABLE

All sales shall be governed by the Uniform Commercial Code of Oklahoma, U.S.A.

Register your product online to activate your warranty:www.McElroy.com/fusion

(Copy information listed on the machine nameplate here for your records).

Model No. _____

Serial No. _____

Date Received _____

Distributor _____

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Table of Contents

Fusion Equipment Safety

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.

VR00051-11-30-92

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

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

CAUTION 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.

TX00030-12-1-92

Read and Understand

Do not operate this equipment until you have carefully read, and understand all the 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.

VR00052-12-1-92

TX02946-4-15-09

Fusion Equipment Safety

General Safety

SAFE1ST-1222-92

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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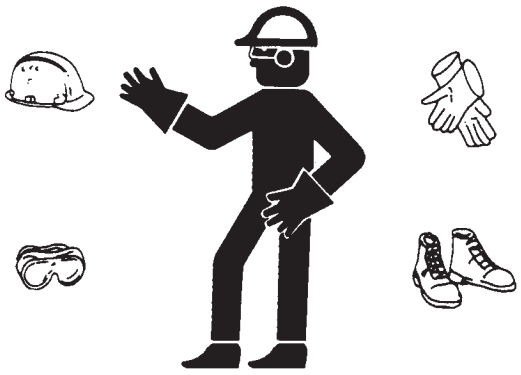
Wear Safety Equipment



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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.

TX00032-4-7-93

Heater Is Not Explosion Proof

VR00034-11-30-92

⚠ DANGER This heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

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

TX00100-04-28-14

Fusion Equipment Safety

Electrical Safety

⚠WARNING 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: Disconnect the equipment from the power source before attempting any maintenance.

VR00055-4-7-93

VR00025-11-30-92

TX02947-4-15-09

Heater is Hot

⚠CAUTION The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater shroud when not in use, and use care when heating the pipe.

NOTICE: Use only a clean non-synthetic cloth to clean the heater plates.

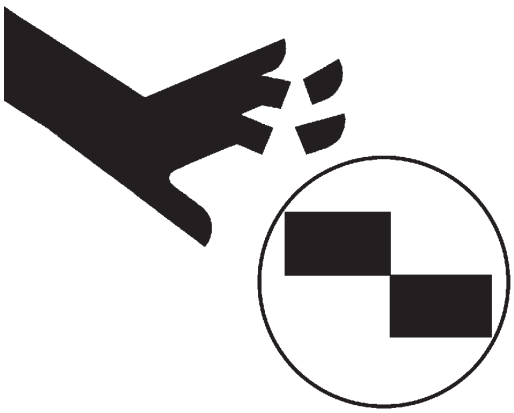
VR00030-2-10-93

TX04244-10-12-10

Facer Blades Are Sharp

⚠CAUTION Facer blades are sharp and can cut. Use care when operating the facer, and when handling the unit.

NOTICE: Never extend the blade beyond the inner or outer circumference of the facer.



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Fusion Procedures

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

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

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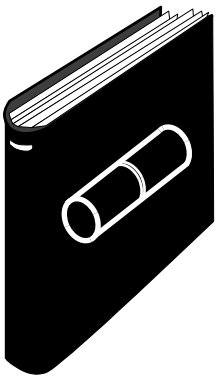

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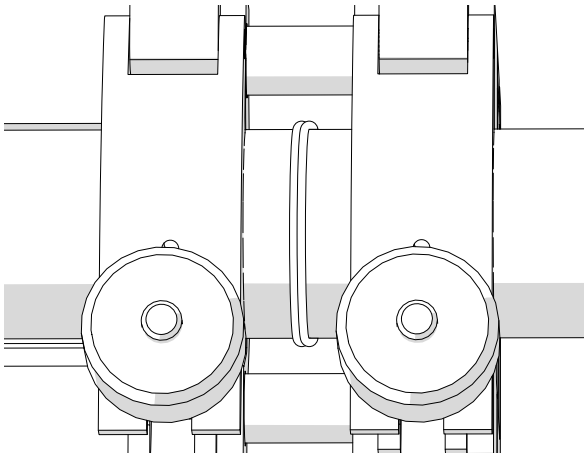
Overview

Theory of Heat Fusion

The principle of heat fusion is to heat two pipe surfaces to a designated temperature, and then fuse them together by application of force. This develops pressure which causes flow of the melted materials, which causes mixing and thus fusion. When the thermoplastic material is heated, the molecular structure is transformed into an amorphous condition. When fusion pressure is applied, the molecules from each thermoplastic part mix. As the joint cools, the molecules return to their form, the original interfaces are gone, and the fitting and pipe have become one monolithic unit. A strong, fully leak tight connection is the result.



The principal operations include:

Clamping The pipe pieces are held axially and radially to allow all subsequent operations to take place.

Facing The pipe ends are faced to establish clean, parallel mating surfaces perpendicular to the centerline of the pipes.

Aligning The pipe ends are aligned with each other to minimize mismatch of the pipe walls.

Heating A melt pattern that penetrates into the pipe is formed around both pipe ends.

Fusing The melt patterns are joined with a specified force, which is constant around the pipe interfacial area.

Cooling The fusion joint is held immobile with a specified force until adequately cooled.

Inspecting Visually examine the entire circumference of the joint for compliance with the standard or fusion procedure used.

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Overview

1LC Fusion Machine

1. 1LC Fusion Machine
2. Facer
3. Heater
4. Heater Sling
5. Ratchet Wrench
6. Case

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PH04337-7-27-10

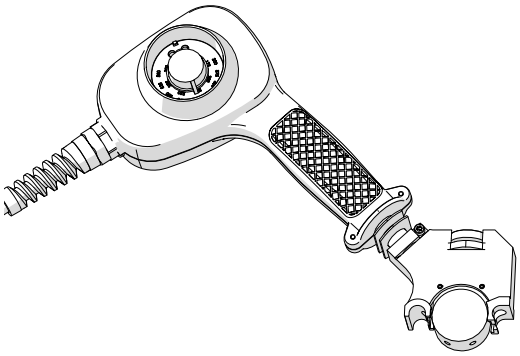
Heater

The heater temperature is controlled by a microprocessor. The heater has a green indicator light which will flash on and off. This indicates that the controller is operating normally. It has a red indicator light. When the heater is plugged in and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

The heater should always be stored in the insulated heater sling for protection of the operator and to minimize heat loss and risk of mechanical damage.

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

⚠ DANGER Heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.



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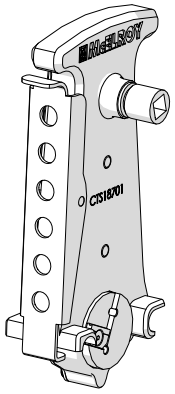
Overview

Facer

The facer is manually operated by using the ratchet wrench to turn the facer. The facer latches into place on the guide rods. The handle must be pressed in to unlatch and remove facer. The facer is symmetrical and can be inserted from either side.

Turn the ratchet counter-clockwise for facing.



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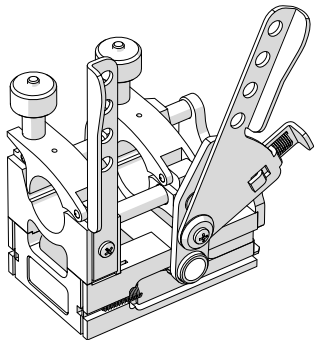
Fusion Machine

The fusion machine offers McElroy's Patented Centerline Guidance System for equal distribution of force around the joint. A 2 position handle for facing and for heat/fuse. The machine is equipped with a locking cam to maintain force during the cooling cycle.



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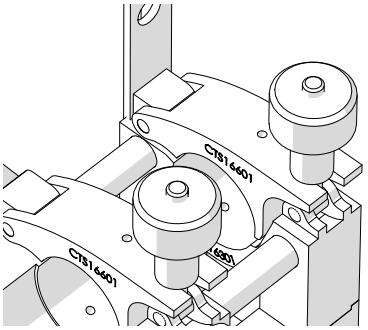
Clamp Knobs

Clamp knobs are equipped with a thrust bearing, which permits the operator to develop high clamping forces with minimal effort.



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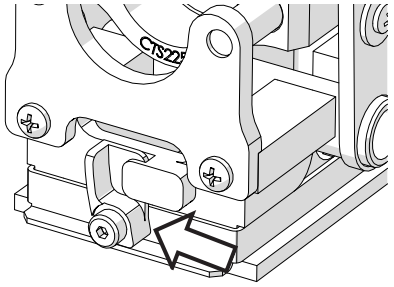
Cam Lock

The cam lock assists in holding force on the joint during the cooling cycle. The lock has a latch for quick release and application of the lock.



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Operation

Read Before Operating

Before operating this machine, please read this manual thoroughly, and keep a copy with the machine for future reference.

The fusion procedures in this manual are for use with polyethylene pipe. If fusing other thermoplastic pipe materials, refer to the pipe manufacturer's suggested procedures or appropriate joining standard.

STOP12-22-92

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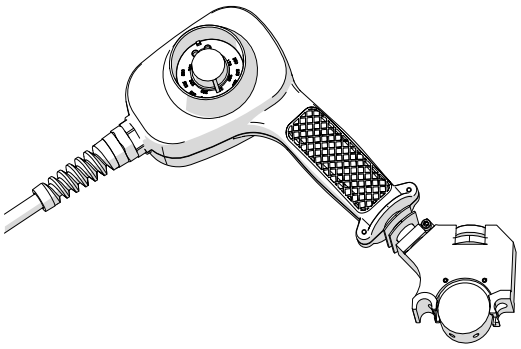
Prepare Heater

⚠ DANGER Heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.



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

NOTICE: Place heater in insulated heater sling while allowing the handle to remain outside the sling.

Plug heater into a proper power source.

Allow heater to heat to operating temperature.

Refer to the "Maintenance" section of this manual for instructions how to adjust heater temperature.

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TX04131-8-28-14

Install Clamping Inserts

Select and install appropriate clamping inserts for the pipe that is being fused.

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TX00368-9-15-94

Operation

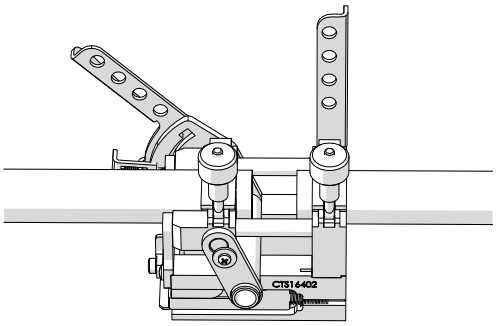
Loading Pipe Into Machine

Clean the inside and outside of pipe ends that are to be fused.

Ensure the locking cam is in the latched position.

Open the upper jaws and insert pipe in each jaw with applicable inserts installed. Let the ends of the pipe protrude about 3/8" past the face of the jaws. Close upper jaws. Tighten the clamp knobs.

NOTICE: When clamping, do not over-tighten the clamp knobs because machine damage can result.



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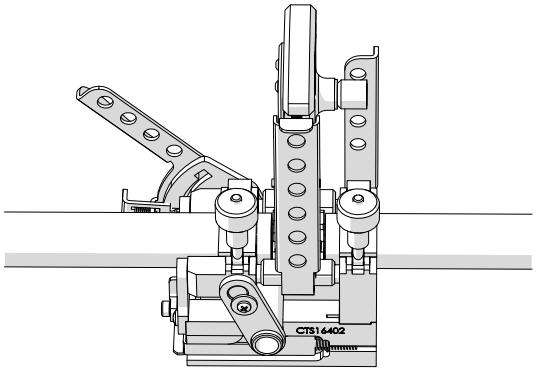
Facing the Pipe

Position the facer between the pipe ends.



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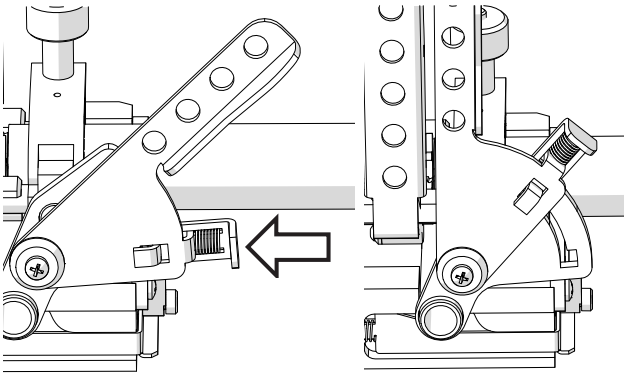
Depress the lock on the lever handle and rotate the lever handle to the vertical position.



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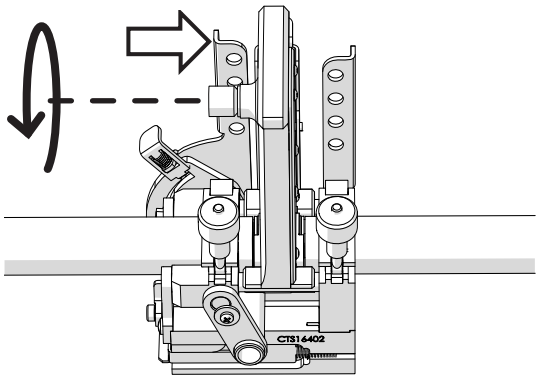
Attach the ratchet wrench to the facer and drive the facer counter-clockwise while applying pressure to the lever handles. Face the pipe until the clamping jaws bottom out on the facer stops. Continue to face the pipe several revolutions to ensure that there are no chips hanging on the end of the pipe.

IMPORTANT: It is critical for proper face-off and alignment, that facing continues until the facer bottoms out.

Open the carriage and remove the facer.



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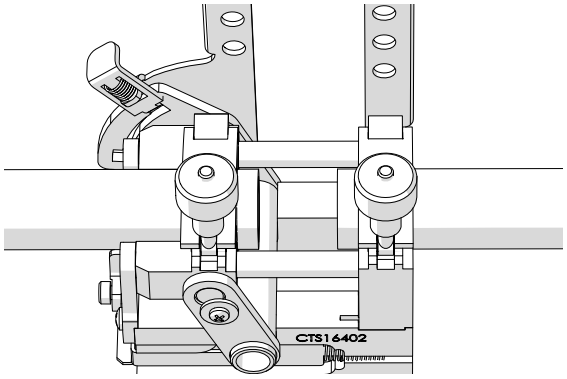
Check Alignment of Pipe

Remove all pipe shavings. Do not touch the pipe ends.

Bring the pipe ends together under sufficient force to overcome any pipe drag or friction in the system. Check for alignment and proper face off. If high/low (misalignment) exists, adjust by tightening the clamp on the high side and reface the pipe.

NOTICE: When clamping, do not over-tighten the clamp knobs because machine damage can result. Check to see if there is space between the upper and lower jaws. If the two jaws are touching, do not continue to tighten. Bring the pipe ends together under fusion pressure plus drag to check for slippage. If slippage occurs, return to **Loading Pipe into Machine**.



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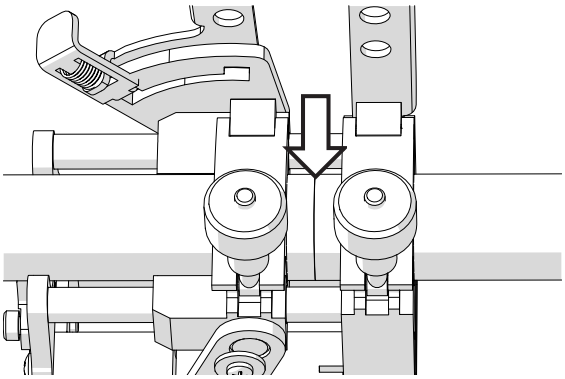

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Check Heater Temperature

NOTICE: Incorrect heating temperature can result in questionable fusion joints. Check heater with a pyrometer and make necessary adjustments.

Refer to the "Maintenance" section of this manual for instructions how to adjust heater temperature.

Check heater surface temperature.

Refer to the pipe manufacturer's recommendations for proper heater temperature.

IMPORTANT: The dial thermometer on the heater indicates internal temperature which varies from the actual surface temperature.

The dial thermometer can be used as reference once the surface temperature has been verified.

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TX04114-8-28-14

Inserting Heater

⚠ DANGER Heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

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

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

Verify heater temperature by noting the reading on the dial thermometer.

Depress the lock on the lever handle and rotate the lever handle clockwise until it latches.

Insert heater between the pipe ends. Bring the pipe ends against the heater faces using the pipe manufacturer's time, temperature and pressure recommendations or appropriate joining standard for the heating cycle.

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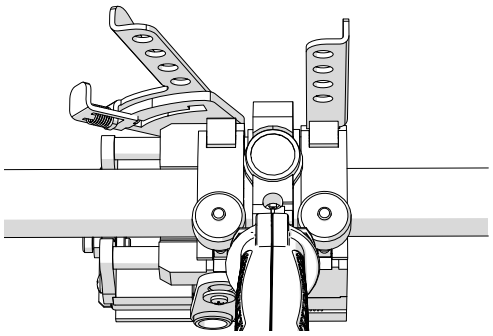
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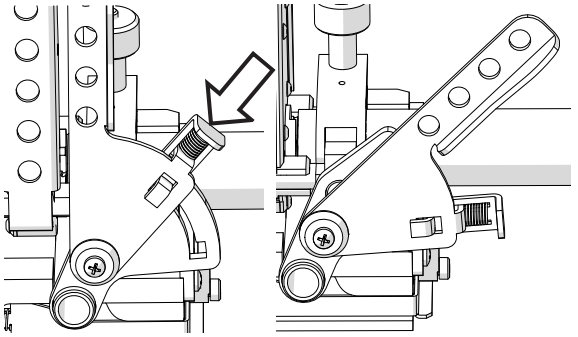
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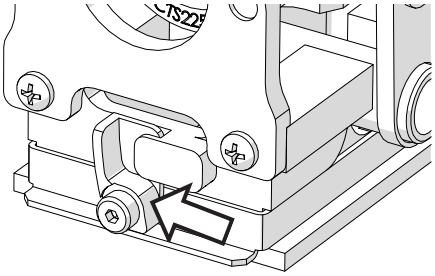
Fusing the Pipe

After the heating cycle is completed, open the carriage and remove the heater and quickly apply fusion force with the lever handle in accordance with the pipe manufacturer's recommended fusion procedure or appropriate joining standard. Hold this force for at least 10 seconds.

After 10 seconds, unlatch the locking cam to assist in holding jaw position during the cooling cycle.

NOTICE: Failure to follow pipe manufacturer's heating time, pressure and cooling time may result in a bad joint.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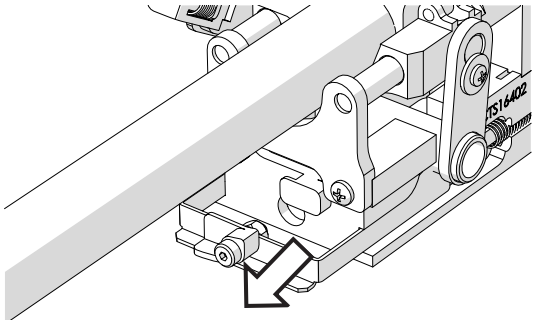
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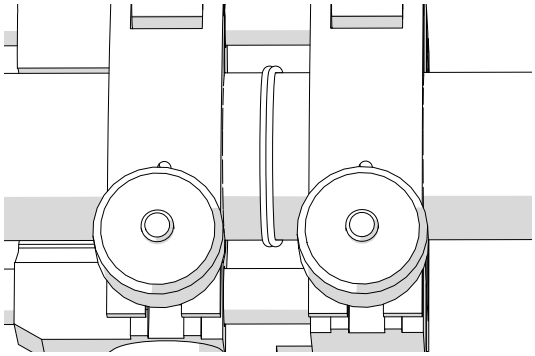
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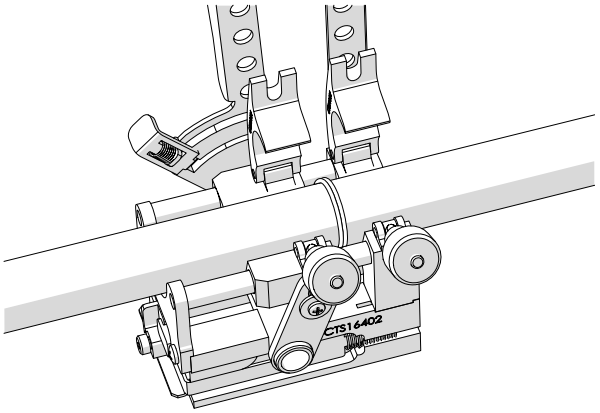
Remove the Pipe from the Machine

When the cooling cycle is completed, relatch the cam lock, unclamp and remove the pipe from the machine.



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Maintenance

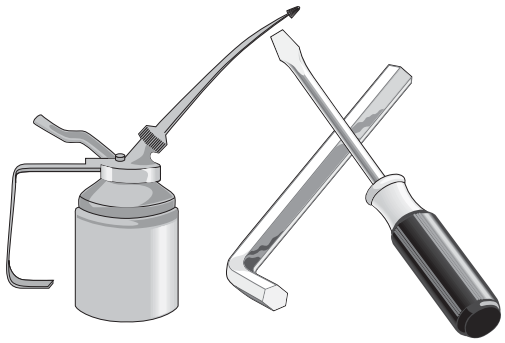
Preventative Maintenance

To insure optimum performance, the machine must be kept clean and well maintained.

With reasonable care, this machine will give years of service. Therefore, it is important that a regular schedule of preventive maintenance be kept.

Store machine inside, out of the weather, whenever possible.

TX00428-8-10-95

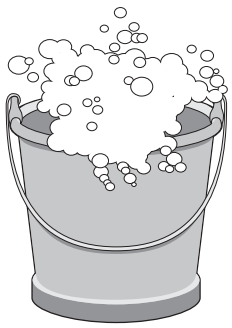


CD00142-11-2-94

Cleaning the Machine

The machine should be cleaned, as needed with a soap and water wash.

TX01015-7-8-96

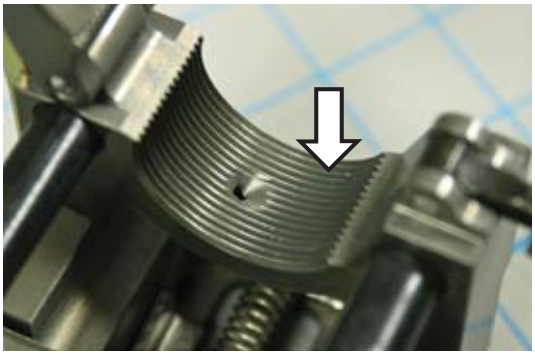


CD00178-5-3-96

Remove Dirt

Remove dirt from jaw and insert serrations and clamp knob eyebolts.

TX00865-1-30-96



PH04247-7-10

Clean and Lubricate Bearings

All clamp knobs are equipped with thrust bearings to reduce friction and improve efficiency of the clamping screw. Keep these bearings clean by washing in kerosene or solvent. They should be lubricated with light machine oil. The knob must be replaced if they become inoperative.

TX04135-7-27-10

PH04245-7-7-10

Maintenance

Clean Eyebolt Threads

Keep the clamp knob eyebolt threads brushed clean.

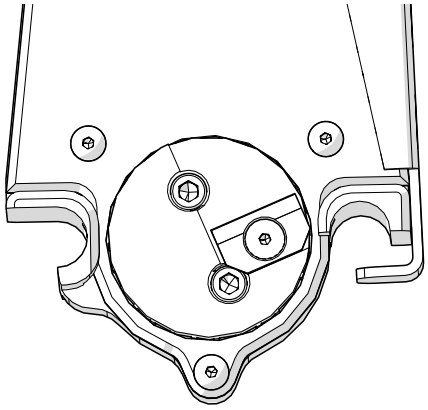
TX00435-9-13-94

PH04244-7-7-10

Facer and Blades

Inspect the facer blades for sharpness and damage. Blades can not be resharpened and should be replaced when dull or damaged.

TX04118-7-9-10



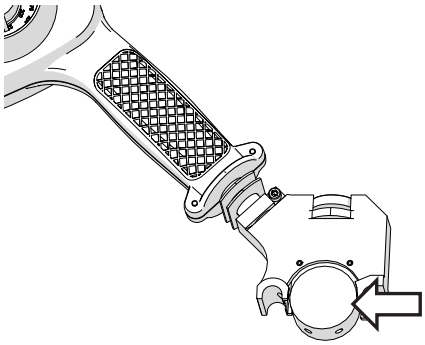
CD02055-05-08-17

Clean Heater Surfaces

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

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

TX04119-7-9-10



CD02040-05-08-17

Adjusting Heater Temperature

Turn knob to desired temperature. Measure the heater surface temperature with a pyrometer. Any variance must be corrected to the pyrometer reading.

Loosen setscrew in the knob. Turn knob to point to the same temperature as the pyrometer. Tighten setscrew in the knob.

Turn knob to desired temperature. Allow heater to stabilize at the new temperature (5 to 10 minutes) after adjusting.

The thermometer on the heater body indicates internal temperature and should be used as a reference only.

TX02009-3-13-02

PH02313-4-24-02

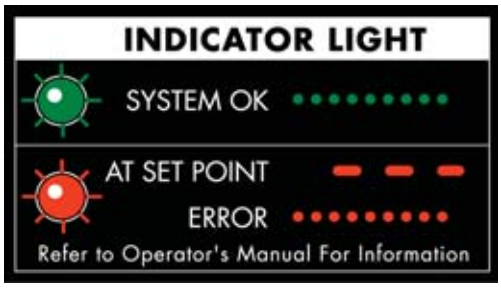
Heater Indicator Light

The heater has a green indicator light which will flash on and off. This indicates that the controller is operating normally. If the green indicator is not flashing then the controller may not be operating properly. If this occurs, disconnect power and have the heater repaired by an McElroy Authorized Service Center.

PH02314-4-24-02

The heater has a red indicator light on the handle at the bottom of the temperature scale. When the heater is plugged in and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

If the heater is not operating properly, the control will attempt to turn the heater off and the red indicator light will flash rapidly. If this occurs, disconnect the power and take it to a McElroy Authorized Service Center for repair.



PH02571-09-16-03

TX04036-4-12-10

Maintenance Checklist

1LC Fusion Machine Checklist

Item to Check	Satisfactory	Needs Repair	Repair Comments
UNIT			
Machine is clean			
Clamp knob bearings lubricated and move freely			
Movable jaw moves freely			
Locking cam works properly			
Guide rods are not damaged			
Clamping jaw and insert grooves are clean			
All nuts and bolts are tight			
FACER			
Check for play in blade holder			
Facer does not wobble when trapped between jaws			
Blades are in good condition			
Latch handle locks onto guide rod freely			
Facer moves on guide rods without excessive force			
Facer is clean and free of grease on blade holder surface			
HEATER			
Heater surface is clean and in good condition			
Thermometer is in good working order			
Surface temperature checked with pyrometer			

Specifications

1LC Fusion Machine

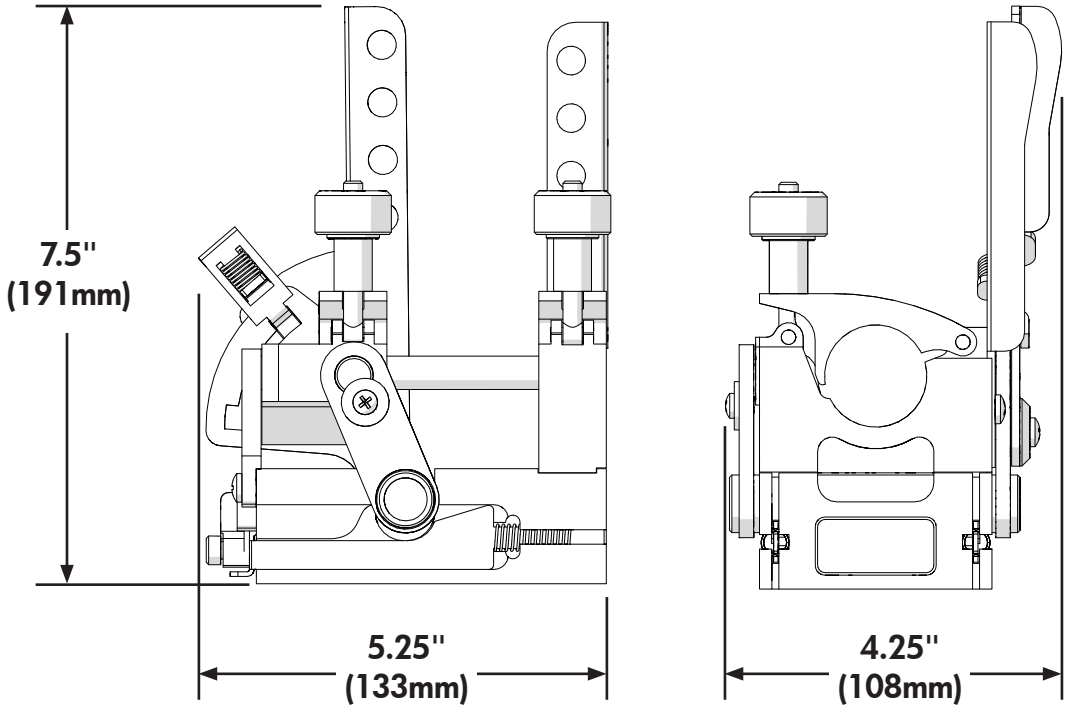
Specification:

Designed for 1/2" CTS - 1" IPS (16mm - 34mm)

Dimensions:

Width:	4.25" (108mm)
Length:	5.25" (133mm)
Height:	7.5" (191mm)
Weight:	3.6 lbs. (1.6 Kg)

Heater:	100 W, 100V-120V, 50/60Hz, 1Ph 100 W, 200V-240V, 50/60Hz, 1Ph
Weight:	2.5 lbs. (1.13 Kg)
Facer:	Hand-operated with 3/8" square drive
Weight:	1.8 lbs. (0.82 Kg)
Mechanical Advantage:	3.8 to 1



TX04137-05-08-17

About this manual . . .

McElroy Manufacturing continually strives to give customers the best quality products available. This manual is printed with materials made for durable applications and harsh environments.

This manual is waterproof, tear resistant, grease resistant, abrasion resistant and the bonding quality of the printing ensures a readable, durable product.

The material does not contain any cellulose based materials and does not contribute to the harvesting of our forests, or ozone-depleting constituents. This manual can be safely disposed of in a landfill and will not leach into ground water.

TX001660-8-19-99

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