

Operator's Manual




McELROY

www.mcelroy.com



2CU Fusion Machine

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Original Language: English

 **WARNING** Cancer and Reproductive Harm -
www.P65warnings.ca.gov

8163361

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 2CU (Combination Unit) model fusion machine is designed with butt fusion and sidewall fusion capabilities. The narrow clamp design provides for butt fusion of tees, ells and other fittings without added adapters and allows precise pipe alignment at the fusion joint.

The 2CU model fuses 1/2" CTS to 2" IPS pipe (20mm to 63mm).

Sidewall clamps with chain vise permit fixing unit to centerline of pipe main for saddle fusion. Factory chain length will clamp 8" IPS (200mm) pipe.

With reasonable care and maintenance, these machines 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.



PH01559-6-13-99

TX01037-7-18-96

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.



MU2-03-13-14

TX04659-03-24-14

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.

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 aforesaid 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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Tulsa, Oklahoma, USA

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Fusion Equipment Safety

WR00051-11-30-92

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**.



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.



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.



WR00052-12-1-92

TX02946-4-15-09

Fusion Equipment Safety

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.



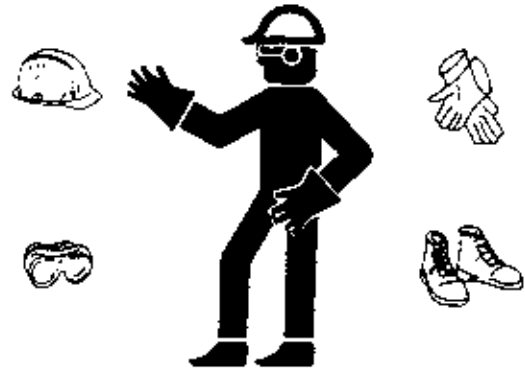
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TX00114-4-22-93

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.



WR00053-12-2-92

TX00032-4-7-93

Heater Is Not Explosion Proof



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

When 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.



WR00034-11-30-92

TX04467-03-24-14

Fusion Equipment Safety

Electrical Safety

⚠ WARNING

Always ensure equipment is 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.

NOTICE: Disconnect the battery before attempting any maintenance or adjustment.



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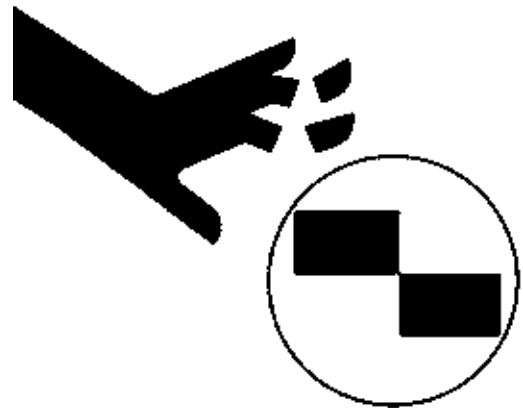
Facer Blades Are Sharp

⚠ WARNING

Facer blades are sharp and can cut. Never attempt to remove shavings while the facer is running, or is in the facing position between the jaws. Use care when operating the facer, and when handling the unit.

NOTICE: Disconnect power from the facer, and remove the facer blades before attempting any maintenance or adjustment.

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



TX02378-1-24-05

WR00073-4-6-93

Heater is Hot

⚠ CAUTION

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 nonsynthetic cloth to clean the heater plates.



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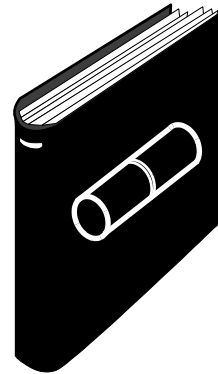
Fusion Equipment Safety

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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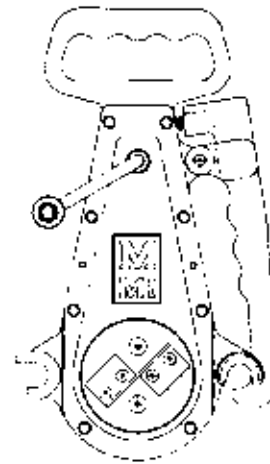
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Transporting 2LC and 2CU Units

On smaller machines it is easiest to carry the unit if the facer is securely installed and locked on the fusion unit. The facer has a handle that allows the unit to be firmly grasped and carried.

NOTICE: Do not carry unit by the lever handles because they can release or bend. Care must be used if the unit is grasped elsewhere because numerous pinch points exist.

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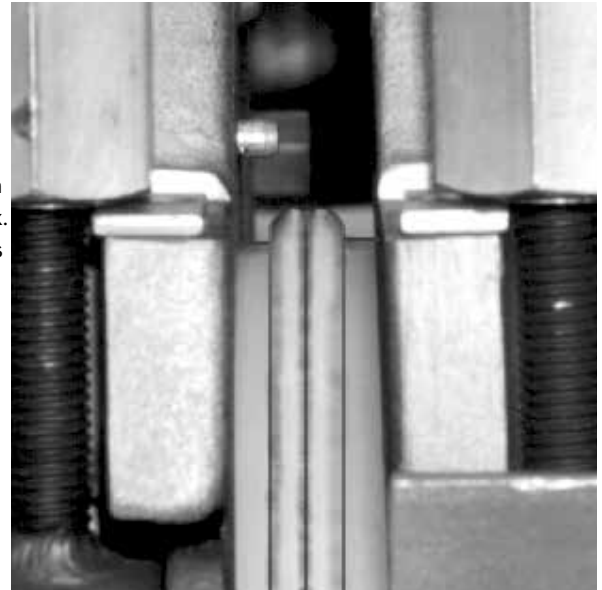
Overview

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.

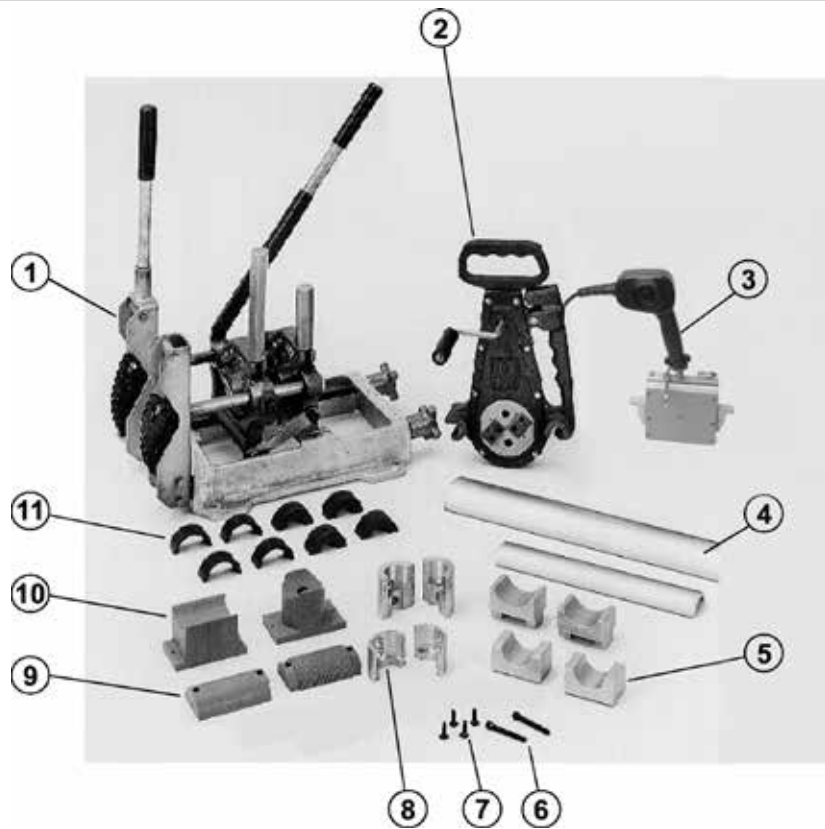


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Overview

2CU Tools Nomenclature

- ① 2CU Machine
- ② Facer
- ③ Heater
- ④ Line Pipe Bolster
- ⑤ Sidewall Clamping Inserts
- ⑥ Heater Adapter Screws
- ⑦ Insert Attaching Screws
- ⑧ Fitting Inserts
- ⑨ Convex Heater Adapters
- ⑩ Concave Heater Adapters
- ⑪ Clamping Inserts

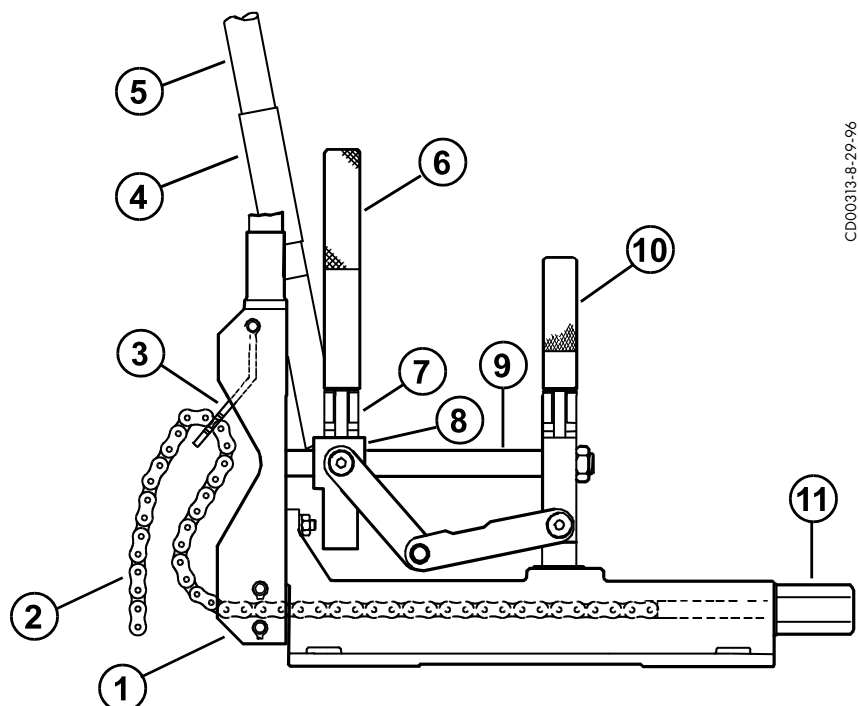


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2CU Machine Nomenclature

- ① Tailstock
- ② Chain
- ③ Chain Hook
- ④ Handle Yoke
- ⑤ Lever Handle
- ⑥ Clamp Knob - Long
- ⑦ Top Jaw
- ⑧ Lower Jaw
- ⑨ Guide Rod
- ⑩ Clamp Knob - Short
- ⑪ Clamp Knob - Chain



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TX01053-7-22-96

Overview

Manual Facer

The manually operated facer has a hand powered crank. Turn the crank counterclockwise for facing.

TX00836-1-5-96



PH01008-12-10-96

Heater



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.

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 a McElroy Authorized Service Center.

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

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

NOTICE: The heater should never be used without fusion heater adapters installed.

To prevent a build-up of plastic pipe residue from accumulating on the heater plates (loss of surface temperature and pipe sticking may result), the heater plates should be cleaned with a non-synthetic cloth before every fusion joint.

TX02216-04-16-14



PH02174-6-22-01



PH02409-12-3-02

Insulated Heater Stand

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

TX00363-9-15-94



PH02408-12-3-02

Butt Fusion Procedure

Read before Operating

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



PH01054-2-20-97

TX00838-1-5-96

Prepare Heater



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.

Install butt fusion heater plates.

NOTICE: The heater should never be used without butt fusion heater plates installed. Refer to the "Maintenance" section of this manual for installation procedure.

Place heater in insulated heater stand.

Plug heater into a proper power source.

Allow heater to warm-up to operating temperature.

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



PH02408-12-3-02



PH02407-12-3-02

TX00366-04-16-14

Install Clamping Inserts

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



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TX00368-9-15-94

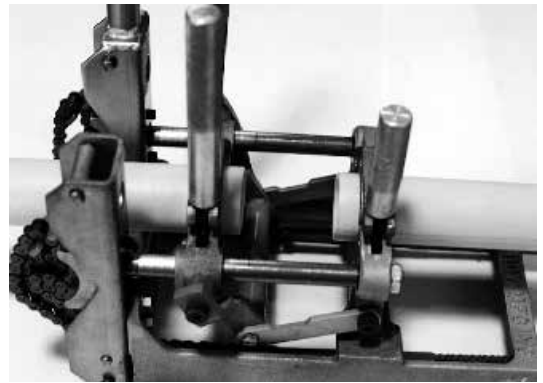
Butt Fusion Procedure

Loading Pipe Into Machine

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

Open the upper jaws and insert pipe in each pair of jaws with applicable inserts installed. Let the ends of the pipe protrude about 1" past the face of the jaws.

TX00371-9-15-94



PH00930-8-28-96

Positioning Pipe in Machine

Position the facer on the guide rods and lock into position. Using lever handle, bring pipe ends together against the facer, watching the gap between the facer stops and the pipe clamping jaws. Leave enough **gap** so that proper face-off will be achieved when the facer stops are bottomed out against the clamps. Tighten the pipe clamp knobs until firm resistance is felt. Do not over-tighten.

NOTICE: Thoroughly clean all dirt and debris from pipe ends before facing.

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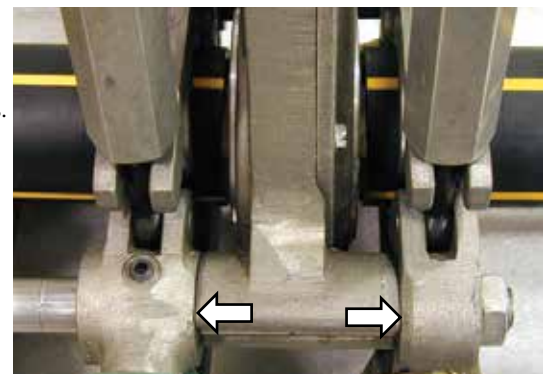
Facing the pipe

Turn facer handle counterclockwise and apply firm pressure on lever handle. Continue facing until facer stops have bottomed out against the clamping jaws. Stop rotation of facer.

Unlatch and remove facer. Remove shavings from pipe ends and machine. Do not touch faced pipe ends.

Inspect both pipe ends for complete face off. If the face off is incomplete, return to **Loading Pipe Into Machine**.

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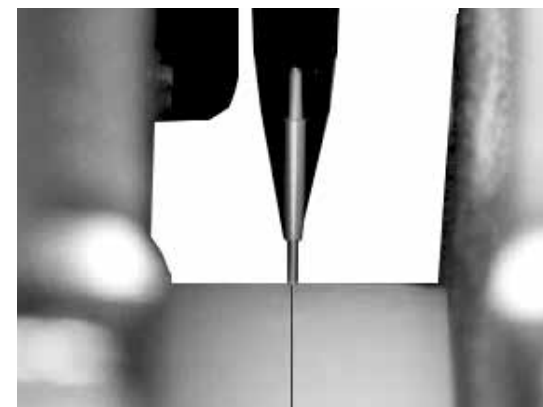
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Check Alignment of Pipe

Bring the pipe ends together and check for alignment. If high/low (misalignment) exists, adjust by tightening the high side clamp. When pipe is properly aligned, tighten both clamps simultaneously to ensure against pipe slippage.

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.

TX01164-12-11-96



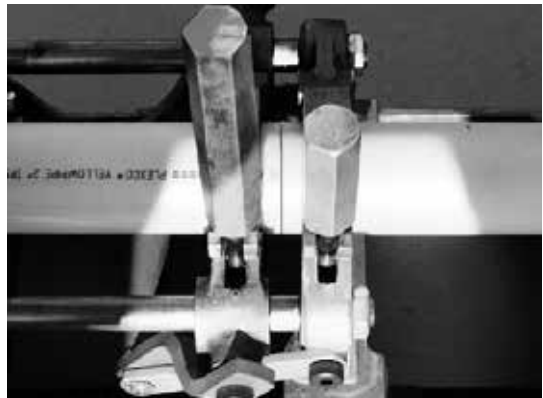
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Butt Fusion Procedure

Check for Slippage

Bring the pipe ends together under fusion pressure to check for slippage. If slippage occurs, return to **Loading Pipe into Machine**.

TX01165-12-11-96



PH01016-12-20-96

Check Heater Temperature

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

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.

TX00375-6-12-13



WR00077-4-16-93



PH02405-12-3-02

Inserting Heater



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 nonsynthetic cloth to clean the butt fusion heater surfaces.

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

Insert heater between the pipe ends.



PH02404-12-3-02

TX00377-04-16-14

Butt Fusion Procedure

Heating the Pipe

With heater in position between the pipe ends, snap pipe ends sharply against the heater to ensure alignment. Follow the pipe manufacturer's recommendations for heating time and pressure.

TX01040-7-18-96



PH02412-12-3-02

Fusing the Pipe

After the heating cycle is completed, 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. A torque wrench can be used when a specified Interfacial Pressure is required.

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



PH03123-12-6-05

TX04766-12-08-14

Butt Fusion Procedure

Optional Use of Torque Wrench

When a specified Interfacial Pressure is required in the fusion procedure, a torque wrench can be used.

To calculate the proper torque reading see Section "Determine Fusion Force."

Add the torque required to overcome Drag (the force required to move the pipe at or near the point of fusion) to the torque reading to assure the proper joining force. This should be determined prior to inserting the heater.

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



PH03123-12-6-05

TX02575-12-08-14

Remove Pipe From Machine

After pipe has sufficiently cooled, open the jaws and remove the pipe.



PH00946-9-3-96

TX01102-9-3-96

Saddle Fusion Procedure

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.

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.

Select appropriate heater and sidewall fusion heater adapters. Attach the adapters to the heater.

Place heater in insulated heater stand.

Plug heater into a proper power source.

Allow heater to warm-up to operating temperature.

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

TX01042-12-08-14



PH02408-12-3-02



PH02406-12-3-02

Remove Fixed Jaw Insert

Remove the insert from the lower fixed jaw to allow room for movement of the fitting inserts in the movable jaw.

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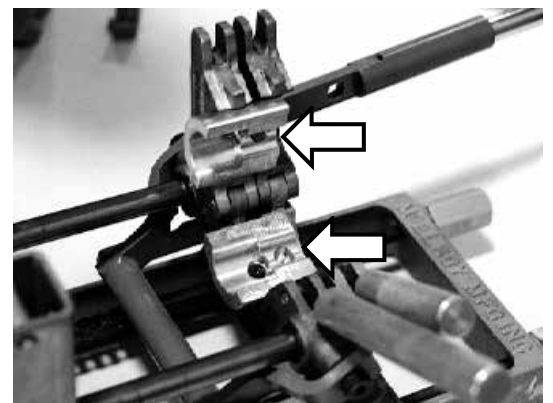


PH00934-9-3-96

Install Fitting Inserts

Select and install appropriate fitting inserts in the movable jaw.

TX01103-9-3-96



PH00936-9-3-96

Saddle Fusion Procedure

Unfasten Chains

Loosen the chain clamping knobs and unhook chain from chain hooks.

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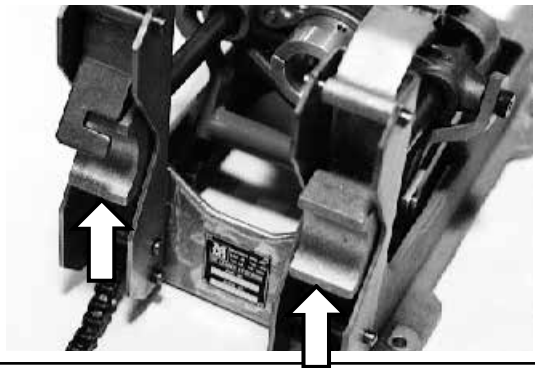


PH00936-9-3-96

Install Sidewall Clamping Inserts

Select the appropriate sidewall clamping inserts. (Not required for 6" main size and larger). Attach the inserts to the tailstock jaws. The attaching screws install through the back of the tailstock and screw into the insert.

TX01544-5-6-98



PH00937-9-3-96

Attach Fusion Machine to Main

Place the machine on the main.

Place a line bolster on main opposite the tailstock assembly if required. A bolster is not required on 6" or larger pipe.

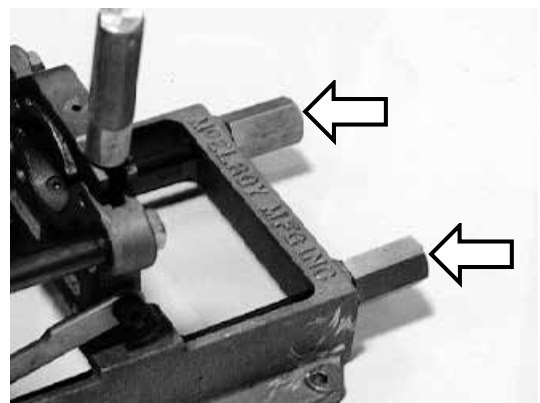
Position the tailstock chains around the main and lock into the chain hooks.

Tighten the machine onto the main using the chain clamp knobs.

TX01045-7-22-96



PH00938-9-3-96



PH00939-9-3-96

Saddle Fusion Procedure

Clean Surfaces

Use 50 or 60 grit utility cloth to clean and rough the main to expose fresh material.

Rough the base of the fitting unless the manufacturer specifies otherwise.

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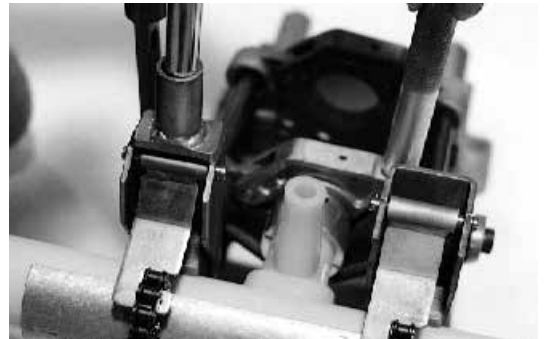


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Clamp Fitting

Position the fitting loosely in the movable jaw and move fitting against the main. Make sure fitting is properly seated on the main and tighten jaw clamp.

TX01046-7-22-96



PH00941-9-3-96

Test for Slippage

Bring the fitting against the main under pressure to ensure that no slippage or movement of the main or fitting occurs.

TX01047-7-22-96



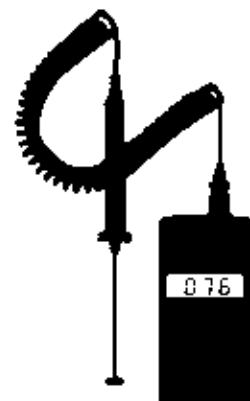
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Check Heater

Use a Pyrometer and verify that the heater is at proper temperature. Refer to the pipe manufacturer's recommended procedures.

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

TX01048-7-22-96



WR00077-4-16-93

Saddle Fusion Procedure

Heat Pipe and Fitting



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.

Move the jaw to bring the fitting into contact with the heater and the heater in contact with the pipe.

Establish proper melt pattern as specified by the pipe manufacturer.

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



PH02410-12-3-02

TX01050-12-08-14

Fuse Fitting to Pipe

Move the jaw and fitting back just enough to remove the heater. Remove the heater with a snap action and quickly inspect the melt pattern. Quickly move the jaw and fitting against the main under the pipe manufacturer's recommended pressure.

NOTICE: The operator must maintain the fusion force until the joint has cooled for the pipe manufacturer's, recommended time.



PH00943-9-3-96

TX01051-7-22-96

Remove Machine

Allow joint to cool for recommended time.

Loosen the clamp knob and open jaw holding fitting.

Loosen chain clamp knobs and unhook chains from pipe.

Remove fusion machine.



PH00943-9-3-96

TX01052-7-22-96

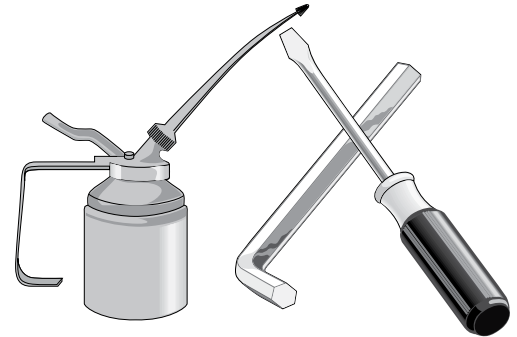
Maintenance

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.

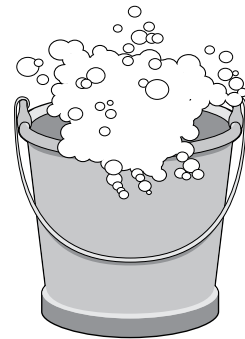


TX00428-8-10-95

CD00142-11-2-94

Cleaning Machine

Clean the machine with a soap and water wash as needed. Remove the heater and facer from the spray area before cleaning.



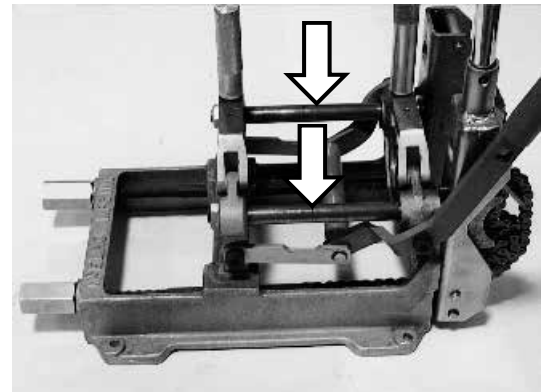
TX00862-1-30-96

CD00178-9-15-95

Clean and Lubricate Guide Rods

Remove oily dirt buildup from guide rods using WD-40® or similar solvent and wipe guide rods clean. Do not leave the cleaning agent on the guide rods.

Remove the 1/16" pipe plugs on each side of the moveable jaw. Lubricate guide rod bushings with SAE 10W-40 motor oil through the oil holes on the movable jaw. Replace the pipe plugs.



PH00944-9-3-96



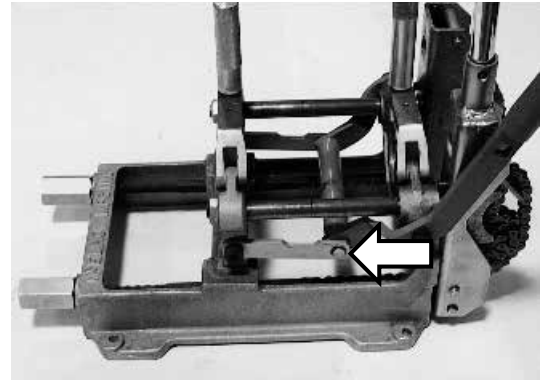
PH02175-6-22-01

TX01174-12-20-96

Maintenance

Pivot Pins and Shafts

Occasionally add a drop of oil to pivot pins and shafts.



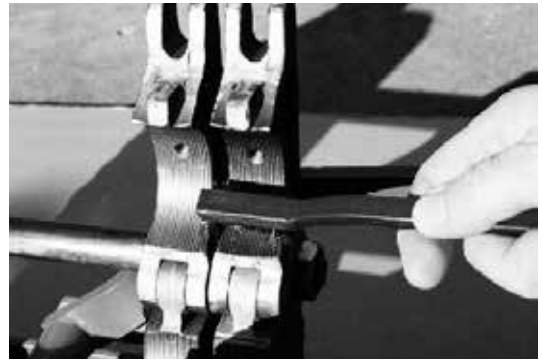
PH00944-9-3-96

TX00864-1-30-96

Clean Jaws and Inserts

To prevent slippage and insure proper alignment, the jaws and inserts must be clean.

Clean the jaws and inserts of any dirt or residual material using a stiff-bristled brush.



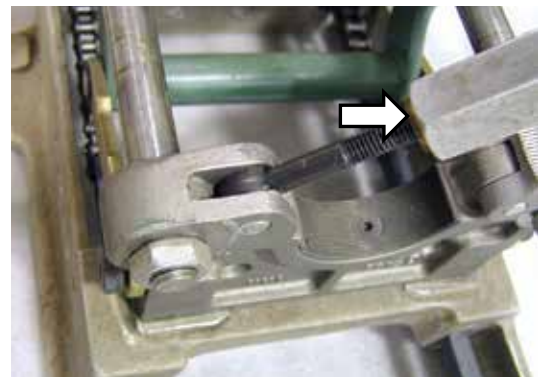
PH01017-12-20-96

TX00433-9-15-94

Clean Thrust Bearings

The thrust bearings located in the clamp knobs must turn freely.

Wash the clamp knob bearing assembly with a solvent, and then lubricate with 30W or lighter oil.

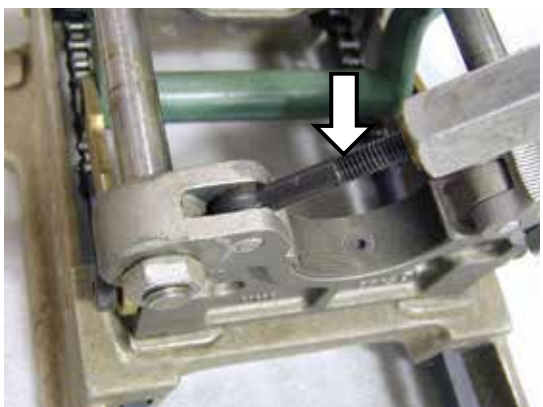


PH00701-1-30-96

TX00434-9-13-94

Clean Eyebolt Threads

Keep the clamp knob eyebolt threads brushed clean.



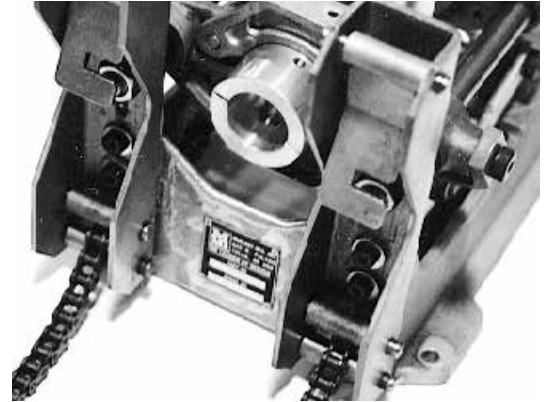
PH00701-1-30-96

TX00435-9-13-94

Maintenance

Fasteners Must Be Tight

Check all nuts, bolts, and snap rings to make certain they are secure and in place.



TX00437-9-13-94

PH00945-9-3-96

Installing Butt Fusion Heater Plates

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

Butt fusion heater plates are installed with eight stainless steel cap screws.

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

IMPORTANT: Do not over tighten the screws.

The surface of the butt fusion heater plates are coated with an antistick coating.



TX00443-6-12-13

PH02407-12-3-02

Clean Heater Surfaces

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

Before each fusion joint the heater surfaces must be wiped with a clean, non-synthetic cloth.

NOTICE: Do not use an abrasive pad or steel wool. Use a non-synthetic cloth that won't damage surfaces.



TX00440-8-14-08

PH02409-12-3-02

Maintenance

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.



PH02314-4-29-02

TX02009-3-13-02

Heater Indicator Light

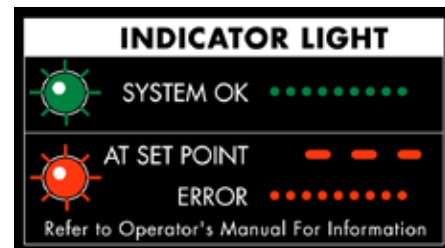
The heater has a green indicator light which will flash on and off. This indicates that the controller is operating normally. If the green indicator is not flashing then the controller may not be operating properly. If this occurs, disconnect power and have the heater repaired by a McElroy Authorized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

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 light glows steadily until the set temperature is reached. The light then goes off and on slowly as the heater maintains temperature.

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



PH02314-4-29-02



PH02571-11-05-03

TX02213-09-16-03

Maintenance

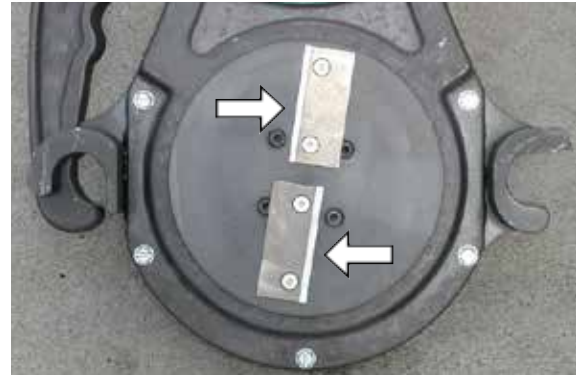
Facer and Blades

The facers are packed with a high temperature grease at assembly. The facer does not require repacking of grease.

Inspect the facer blades for damage and sharpness. If dullness or damage appears on one section of the blade, installing the blade on the opposite side of the blade holder will normally position a sharp edge in the facing zone. Chipped or dull blades must be replaced.

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

TX02473-3-29-05



PH01860-7-25-00

Facer Guides

To minimize friction on the guide rods, keep the guides clean using a clean dry cloth to wipe away debris.

TX02480-3-30-05



PH01860-7-25-00

Maintenance Checklist

2CU Fusion Machine Checklist

Item to Check	Satisfactory	Needs Repair	Repair Comments
UNIT			
Machine is clean			
Clamp knob bearings lubricated and move freely			
Movable jaw lubricated and moves freely			
Chains are clean and lubricated			
Guide rods are not damaged			
Clamping jaw and insert grooves are clean			
Insert spring clips work properly			
All nuts and bolts are tight			
Lever handles are with unit			
FACER			
Check cord, plug and switch			
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			
Cord and plug are in good condition			
Heater surface is clean and in good condition			
Thermometer is in good working order			
Surface temperature checked with pyrometer			

TX01104-12-20-96

Determining Fusion Force

Variable Definitions

O.D. = Outside Diameter
 t = Wall Thickness
 π = 3.1416
 SDR = Standard Dimensional Ratio
 IFP = Manufacturer's Recommended Interfacial Pressure

Formulas

$$t = \frac{\text{O.D.}}{\text{SDR}}$$

$$\text{AREA} = (\text{O.D.} - t) \times t \times \pi$$

$$\text{FORCE} = \text{AREA} \times \text{IFP}$$

$$\text{REQUIRED FORCE} = (\text{O.D.} - t) \times t \times \pi \times \text{IFP} + \text{DRAG}$$

Example

Pipe Size = 2" SDR 11

O.D. of Pipe = 2.37"

SDR of Pipe = 11

Recommended Interfacial Pressure = 75 PSI

Using a Model 2CU Fusion Unit

$$t = \frac{\text{O.D.}}{\text{SDR}} = \frac{2.37}{11} = 0.2154$$

$$\text{REQUIRED FORCE} = (\text{O.D.} - t) \times t \times \pi \times \text{IFP} + \text{DRAG}$$

$$\text{REQUIRED FORCE} = (2.37 - .2154) \times .2154 \times 3.1416 \times 75 + \text{DRAG} = 109 + \text{DRAG}$$

Using the Chart (section 7-2):

From the table you see that:

20 ft/lbs of Torque = 75 lbs Force

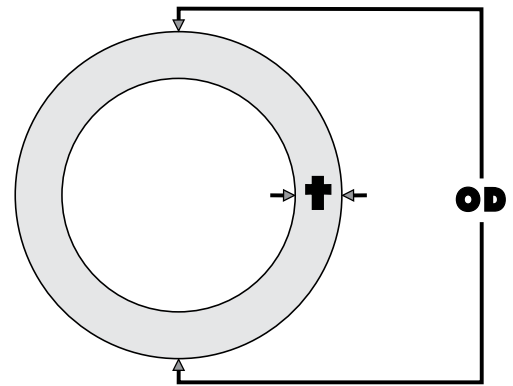
and

30 ft/lbs of Torque = 140 lbs Force

The chart on the next page will assist you in interpolating the proper value of torque to use with the torque wrench.

Interpolating between these two values give approximately 25 ft/ lbs Torque.

FUSION FORCE = 25 ft/lbs + Drag (measured in ft/lbs)

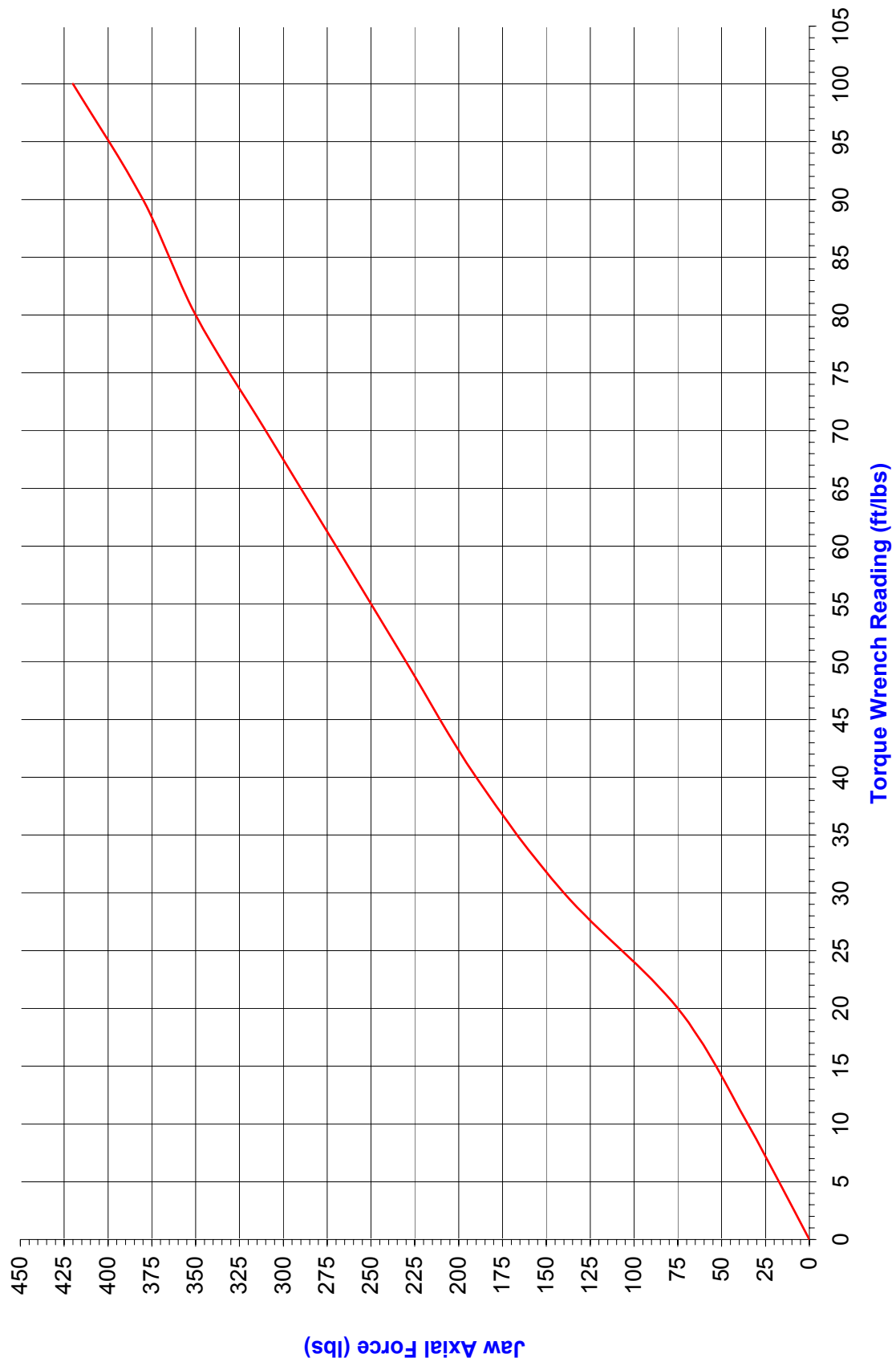


PH03123-12-5-05

Torque Wrench Reading (Ft Lb)	2CU Jaw Axial Force (Lb)
10	35
20	75
30	140
40	190
50	230
60	270
70	310
80	350
90	380
100	420

Determining Fusion Force

Fusion Force for 2CU



Specifications

Model 2CU

Specification:

Designed for 1/2" CTS to 2" IPS pipe
(20mm to 63mm)

Dimensions:

Width: 11.5" (29.2cm)
Length: 20" (50.8cm)
Height: 16" (40.64cm)

Heater: 800 W, 120 VAC, 60 Hz
(240 V, 50 Hz)

Weight:

Machine: 28 lbs. (12.7kg)
Heater: 5.5 lbs. (2.5kg)
Facer: 8 lbs. (2.3kg)

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.



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