Operator's Manual

McELROY

www.mcelroy.com

MegaMc®
1600mm
Fusion Machine

Manual: 6512501 Revision: F 11/17

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 MegaMc® 1600mm fusion machine is designed to butt fuse thermoplastic pipe sizes from 20" O.D. (500mm) to 65" O.D. (1600mm).

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

The machine allows for butt fusion of most fittings without special holders. Mitered inserts are also available for fabricating ells in the shop or in the field.

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.

TX02897-02-04-16

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.

TX02486-02-04-14

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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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.

WR00051-11-30-92

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.

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.

SAFE1ST-1222-92

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.

VR00053-122-92

TX00032-4-7-93

Do Not Operate This Machine in a Hazardous Environment

⚠ DANGER Electric motors and heaters are not explosion proof. Operation of these components in an explosive atmosphere will result in serious injury or death.

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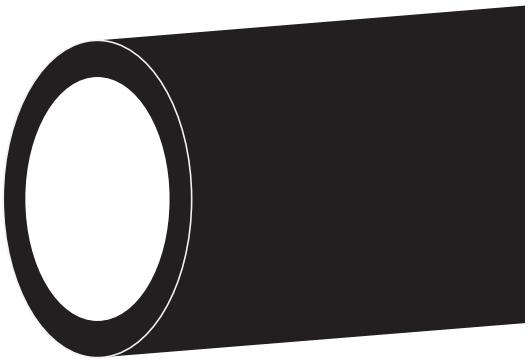
TX00796-04-11-14

Fusion Safety Equipment

Pipe Handling Safety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⚠WARNING Do not position yourself under supported or raised pipe. Pipe is heavy and could result in serious injury or death.

⚠WARNING Pipe that is bent can store a great amount of energy. Do not bend and force the pipe into the machine. A bent pipe with stored energy could cause serious injury or death when that energy is released.

It is recommended that the pipe is always be held securely by either being clamped securely in the fusion machine jaws or attached to the lifting device.

Ensure all portions of the pipe and fittings are clear before lifting the pipe from the machine. If the pipe becomes bound in the machine, do not continue to lift the pipe. Lower the pipe into the machine and ensure the pipe is clear before lifting again.

Keep persons that are not involved in handling pipe away from handling operations. Persons that are involved with handling operations keep away from the pipe when the pipe and handling equipment are in motion. When the pipe and handling equipment are in motion, all persons involved in handling pipe should be able to see all other persons at all times. If any handling person is not in sight, immediately stop moving equipment and pipe and locate that person. Do not continue until all persons are accounted for and in sight.

NOTICE: Do not leave machine unattended while the Power Pack is running. When not operating the machine, turn off the Power Pack. This will prevent accidental or unintentional movement of the machine.

Never push, roll, dump or drop pipe lengths, bundles or coils off the truck, off handling equipment or into a trench. Always use appropriate equipment to lift, move and lower the pipe.

TX04586-07-24-14

Units With Hydraulics

It is important to remember that a sudden hydraulic oil leak can cause serious injury, or even be fatal if the pressure is high enough.


WR00078-4-8-93

⚠WARNING Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes which eject fluid under pressure. Use a piece of cardboard or paper to search for leaks. If any fluid is injected into the skin, it must be immediately removed by a doctor familiar with this type of injury.

⚠WARNING Unwanted movement of the machine could result in serious injury or damage to machine. Unwanted movement of the machine may take place if switches do not match machine state when the machine power is turned on.

NOTICE: Wear safety glasses, and keep face clear of area when bleeding air from hydraulic system to avoid spraying oil into eyes.

TX03007-10-12-10

Fusion Safety Equipment

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.

WR00055-4-7-93

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

NOTICE: Always connect units to the proper power source as listed on the unit, or in the owner's manual.

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

WR00025-11-30-92

⚠WARNING Disconnect the machine from the power source before attempting to service the control panel. Failure to disconnect the power could result in electric shock. Refer service to a qualified technician.

TX03003-10-12-10

Crush Points

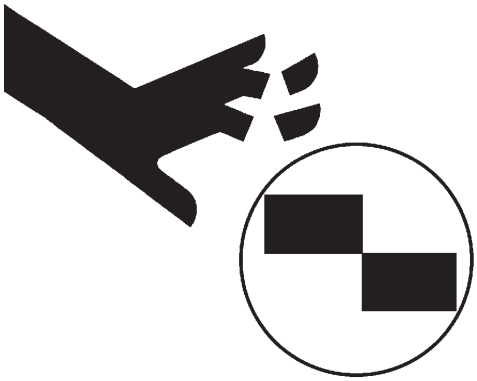
⚠WARNING Hydraulically operated equipment is operated under pressure. Anything caught in the machine will be crushed. Keep fingers, feet, arms, legs, and head out of the machine while operated.

WR00012-12-4-92

TX03004-8-11-09

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.



WR00073-4-6-93

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

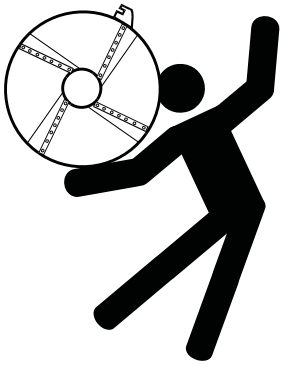
NOTICE: Never extend the blade beyond the inner or outer circumference of the facer.

TX04241-10-12-10

Stand Clear

⚠WARNING Jaws, heater and facer pivot rapidly and can cause severe bodily injury if someone is standing too close. All personnel must stand clear of the back of the machine when operating.

Be aware of yourself and others when operating this machine and when sections of pipe are being moved.



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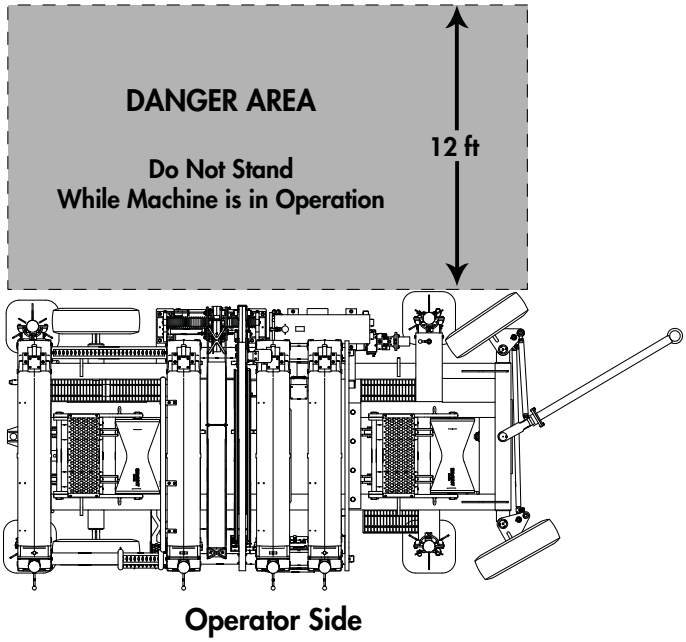

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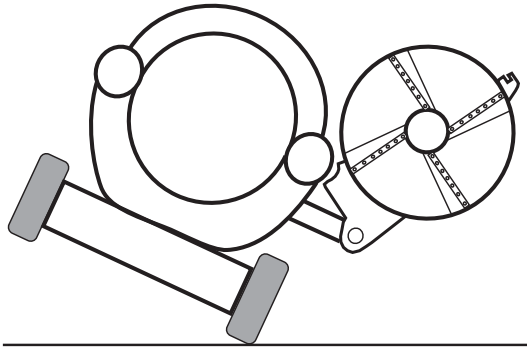
TX00822-05-26-15

Setting Unit

Outriggers must be set before operation of the machine. Position the fusion machine on as level ground as possible. Chock the wheel and adjust outriggers to make it as level and stable as possible.

⚠WARNING This machine can tip over if the outriggers are not set before moving the heater and facer out. Set the outriggers before operating this machine to avoid serious injury.

NOTICE: Always use outriggers to support weight when using pipe in the machine. Failure to do so will result in damage to the tires.



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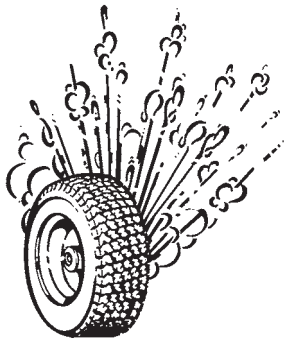
Fusion Safety Equipment

Have Tires Properly Serviced

⚠WARNING Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death. Have tires mounted by someone that is experienced, and has the proper equipment to perform the job safely.



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TX00118-4-22-93

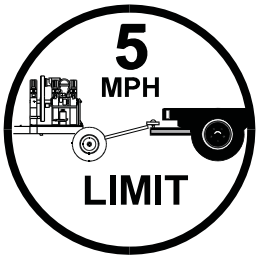
Towing

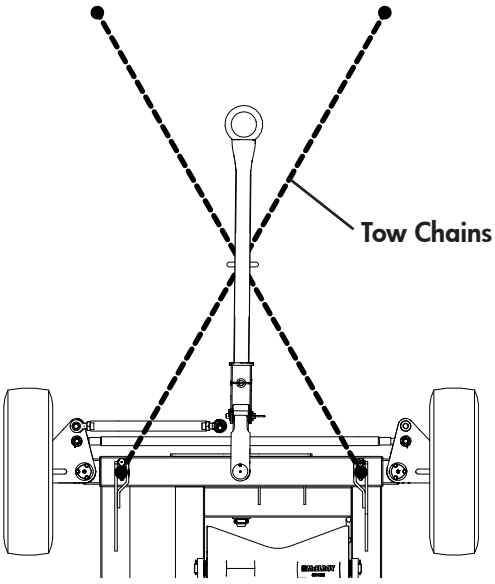
The machine towing speed limit is 5 mph.

NOTICE: The machine is not designed for high speed towing. Attempting to tow the machine at high speeds can result in machine damage. Always transport the machine by flat bed truck or similar means, and make sure the unit is properly secured.

Use the tow chains when towing the machine.

NOTICE: Do not turn fusion machine against the turning stops as machine and towing vehicle damage can occur.





CD01853-11-09-16

CD00189-1-24-96

TX05191-11-09-16

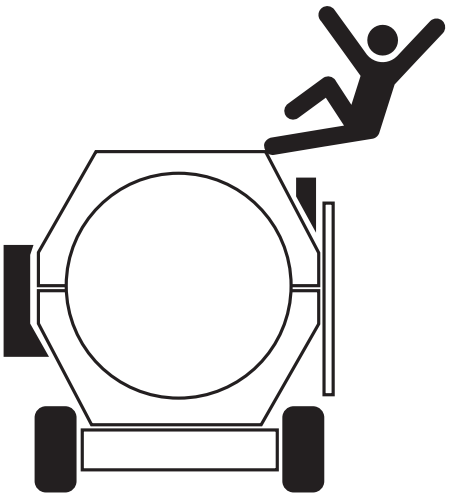
Personal Safety

When operating the fusion machine, be aware of hazards that could cause death or serious injury.

⚠WARNING Disable the fusion machine if it is necessary to enter the machine for maintenance or inspection. Stand only in safe areas of the machine during operation. Failure to do so could result in death or serious injury.

⚠WARNING Hydraulically operated equipment is operated under pressure. Anything caught in the machine will be crushed. Keep fingers, feet, arms, legs, and head out of the machine while operated.

⚠CAUTION Use three points of contact when using ladder and climbing on fusion machine. Failure to do so could result in injury.



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TX03008-8-13-09

Fusion Safety Equipment

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.

TX04244-10-12-10

WR00030-2-10-93

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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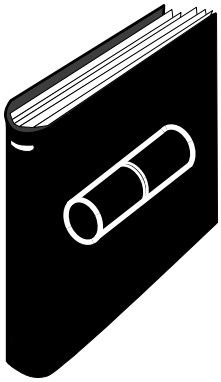

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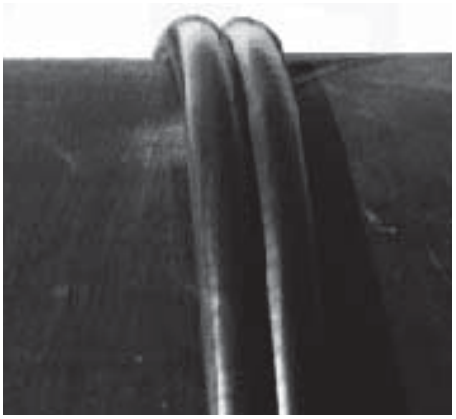
Theory of Heat Fusion



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The principle of heat fusion is to heat two 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 held axially to allow all subsequent operations to take place.

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

Aligning The pipe ends must be aligned with each other to minimize mismatch or high-low of the pipe walls.

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

Joining The melt patterns must be joined with a specified force. The force must be constant around the interface area.

Holding The molten joint must be held immobile with a specified force until adequately cooled.

Inspecting Visually examine the entire circumference of the joint for compliance with standards established by your company, customer, industry, federal, state, or local regulations.

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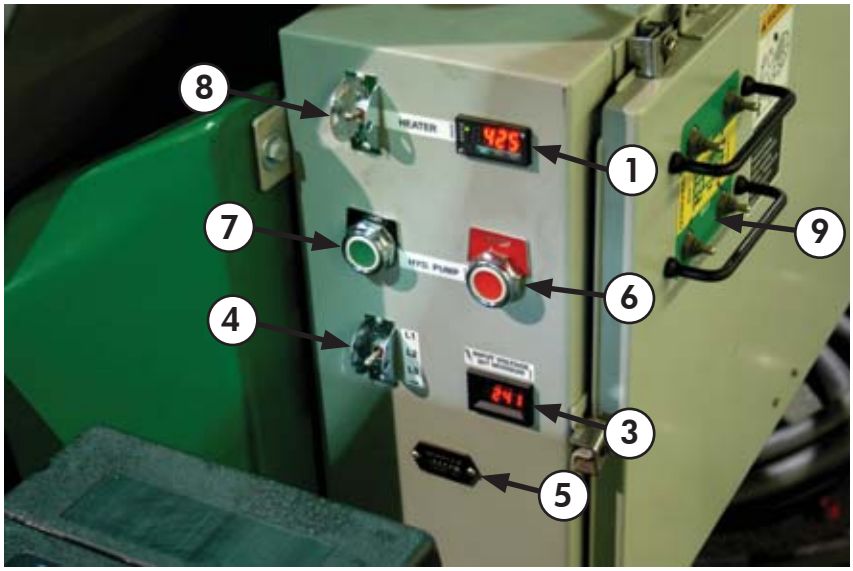

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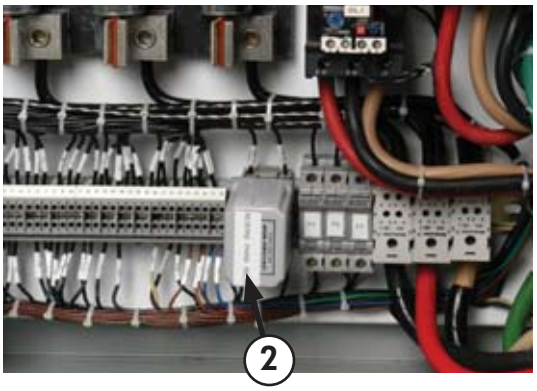

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Control Panel

1. **Temperature Adjustment.** Digital controller used to set heater temperature.
2. **Reverse Phase Relay.** Interrupts power and prevents pump from turning the wrong direction.
3. **Volt Meter.** Displays incoming volts of electricity from the power source.
4. **Volt Meter Selector Switch.** Allows for selecting each incoming phase of a 3-phase electrical system.
5. **Hour Meter.** Registers total hours hydraulic pump has been used.
6. **Stop - Hydraulic Pump.** Shuts off power to the hydraulic pump.
7. **Start - Hydraulic Pump.** Turns power on to the hydraulic pump.
8. **Heater On/Off.** Turns electrical power on and off to heater.
9. **Outrigger Switches.** Controls position of hydraulic outriggers.

⚠WARNING Disconnect the machine from the power source before attempting to service the control panel. Refer service to a qualified technician.

TX02859-1-30-09

Inner Fixed Jaw, Pipe Lift Controls, Heater/Facer, and Indexer

Graphics near switches indicate direction of control and/or function.

1) Inner Fixed Jaw Controls
2) Pipe Lift Controls
3) Heater and Facer Controls
4) Indexer Control

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Outer Fixed Jaw Controls

Graphics near switches indicate direction of control and/or function.

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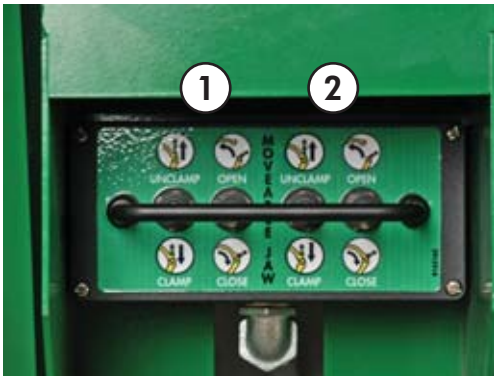
Movable Jaw Controls

Graphics near switches indicate direction of control and/or function.

1) Inner Movable Jaw Controls
2) Outer Movable Jaw Controls



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TX02862-8-13-09

Jaw Clamps

Jaw clamps are hydraulically operated for clamping and unclamping the upper jaws.

NOTICE: Clamp cylinders must always be fully extended and pivoted out when opening or closing the upper jaws. If this is not done, equipment damage will occur.

⚠CAUTION Hoses are under pressure, use caution clamping and unclamping the cylinders to avoid pinching the hoses. Pinching the hoses could cause injury.

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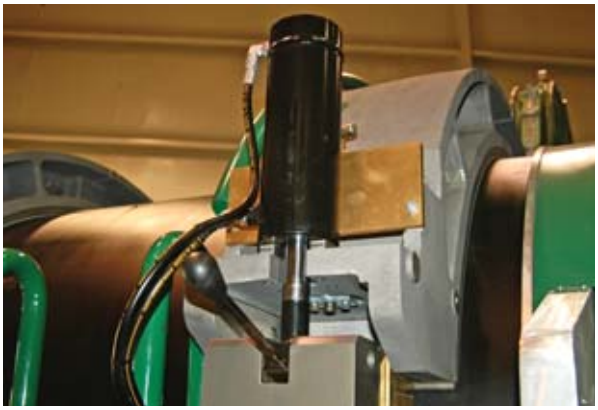

PH03746-1-29-09

Outriggers

Outriggers must be set before operation of the machine. Position the fusion machine on as level ground as possible. Chock the wheel and adjust outriggers to make it as level and stable as possible.

⚠WARNING This machine can tip over if the outriggers are not set before moving the heater and facer out. Set the outriggers before operating this machine to avoid serious injury.

NOTICE: Always use outriggers to support weight when using pipe in the machine. Failure to do so will result in damage to the tires.

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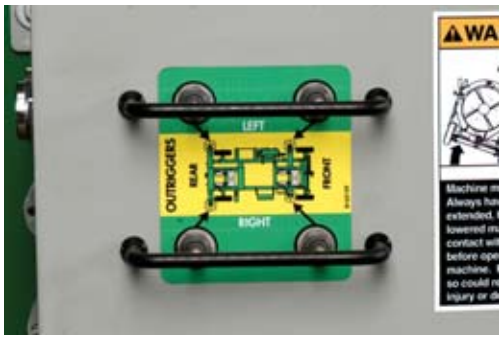

PH03755-8-18-09

PH03747-1-29-09

Electrical Power

⚠DANGER All electrical equipment and power sources must be located outside an explosive atmosphere. Failure to do so will result in serious injury or death.

See SPECIFICATIONS section of this manual for power requirements.

Ensure proper ground for the electrical system.

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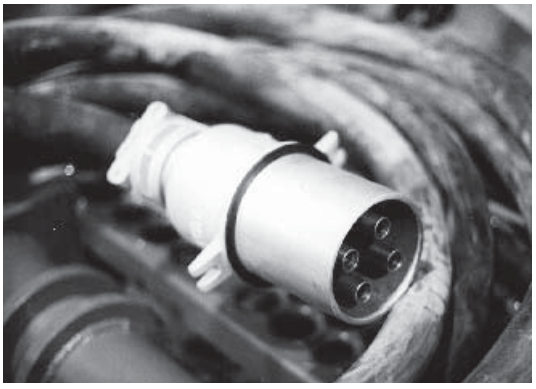

PH00764-3-1-96

Hydraulic Reservoir

Proper level is indicated on the sight gauge. The level should be checked with cold fluid and with the cylinders fully retracted. Fill reservoir to the HIGH level on the sight gauge. Refer to the "Hydraulic Fluids" section of this manual for hydraulic oil recommendations.

Never allow dirt or other foreign matter to enter the open tank.

TX02864-8-13-09

PH03748-1-29-09

Filter and Filler Cap

This machine is equipped with a 10 Micron filter on the return side of the hydraulic system.

Change filter when the indicator gauge (B) is not in the green range.

The reservoir is filled by removing the cap (A) and the filter.

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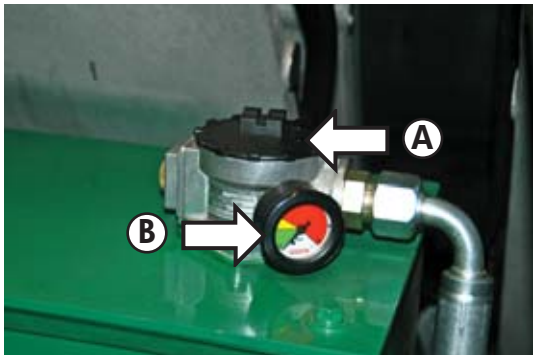

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Hydraulic Manifold Block

Mounted on this block are a carriage directional control valve, a selector valve, three pressure reducing valves, a 3000 psi gauge, and a DataLogger™ port.

A) The carriage control valve, mounted on the top of the manifold, determines whether the carriage is moving left, right, or is in neutral.

B) A 3000 psi carriage pressure gauge is mounted on a bracket above the manifold. This gauge indicates pressure of the carriage control valve.

C) The selector valve, mounted on the upper left of the manifold, selects a reduced pressure from one of the pressure reducing valves.

Each pressure reducing valve is labeled with a different function:

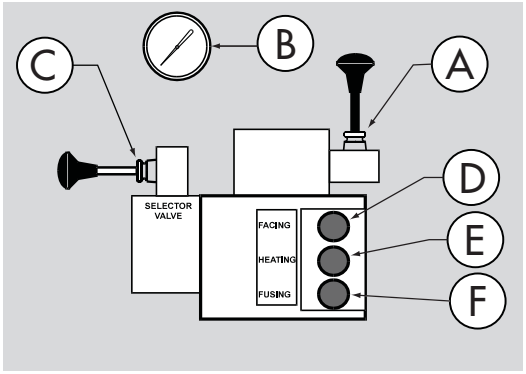
D) The top valve adjusts facing pressure to a maximum of 800 psi.

E) The middle valve adjusts heating pressure to a maximum of 800 psi.

F) The bottom valve adjusts fusion pressure to a maximum of 3000 psi or system pressure, whichever is lower.

G) DataLogger Port

TX02899-10-12-10



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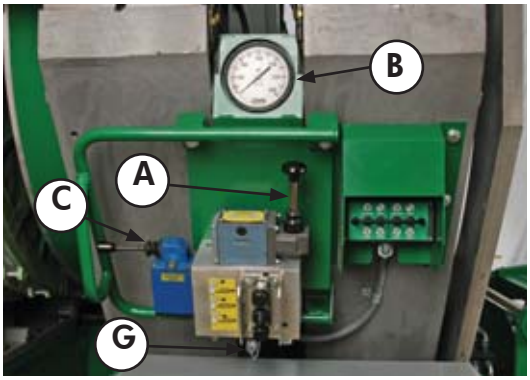

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Electric Motor

The pump motor is a totally enclosed fan cooled motor.

DANGER Electric motors are not explosion proof. Operation of these components in an explosive atmosphere will result in serious injury or death.

TX00720-04-11-14

PH03751-1-29-09

Ball Valves

Two ball valves are located at the reservoir of the machine. These valves open and close the flow of hydraulic fluid on the suction side of each pump.

NOTICE: These valves must be open before operating the machine.

TX03025-8-26-09

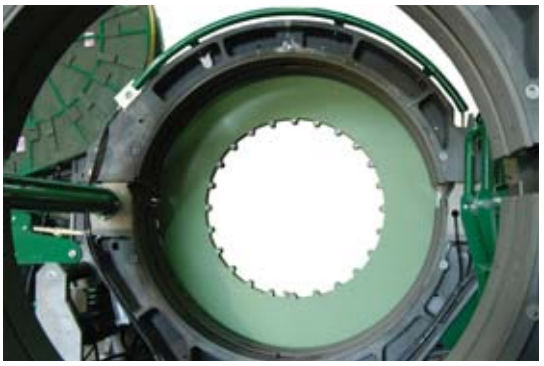
PH03994-8-25-09

Heater

The heater is equipped with butt fusion heater adapters, coated with an antistick coating. One heater is used for 48" DR 26 to 65" pipe. The other heater is used for 20" to 48" pipe.

DANGER This heater is not explosion proof. Operation of heater in an explosive atmosphere will result in serious injury or death.

TX02866-05-26-15



PH04001-8-25-09

Facer

The facer is of the McElroy rotating planer-block design. The blade holders each contain four cutter blades. The block rotates on ball bearings and is chain driven (enclosed in lubricant) by a hydraulic motor.

TX02867-10-12-10

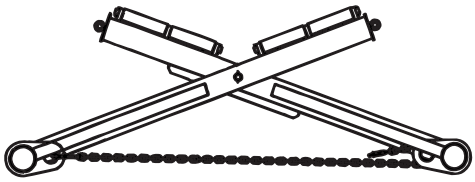
PH03992-8-25-09

Pipe Support Stands

Always use pipe support stands to help support and align the pipe. Position pipe support stands on each end of the fusion machine.

Pipe support stands are sold separately.

NOTICE: Failure to use pipe support stands with the pipe could damage fusion machine.



PH01374- 5- 4- 98

TX03009-8-17-09

Hydraulic Cylinders

HIGH FORCE hydraulic carriage cylinders are painted green. High force cylinders are used when higher interfacial pressures are required, when handling heavy wall pipe, or when large drag factors need to be overcome.

MEDIUM FORCE cylinders are painted orange and have approximately half the total effective piston area as High Force cylinders. The cylinders move faster and are normally used for thinner wall pipe or small diameter pipe and when lower interfacial pressures are used.

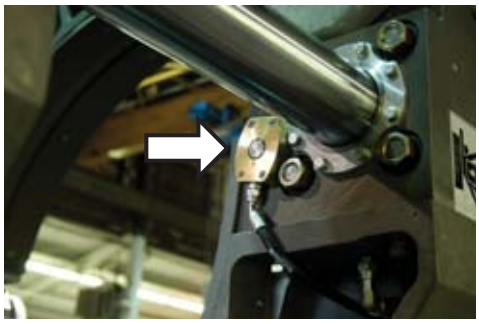
IMPORTANT: Use the correct total effective piston area to calculate fusion gauge pressure.

TX03010-8-17-09

PH03995-8-25-09

Stripping Cylinders

The stripping cylinders hydraulically assist the stripping of the heater from the pipe ends. The cylinders are activated when the indexer switch is used to move the indexer. Stripping cylinders will only activate when the heater is in and the facer is out of the machine.



PH03993-8-25-09

TX03011-8-17-09

Operation

Read Before Operating

STOP11228-95

Before operating this machine, please read this manual thoroughly, and keep a copy with the machine for future reference. Return manual to the protective storage box when not in use. This manual is to be considered part of your machine.

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.

TX03012-8-17-09

Before Starting

PH03994-8-25-09

Before starting the fusion machine, make sure that the ball valves to the pumps are in the open position.

Ensure no one is standing in the danger area of the machine.

⚠WARNING Unwanted movement of the machine could result in serious injury or damage to machine. Unwanted movement of the machine may take place if switches do not match machine state when the machine power is turned on.

TX03022-10-12-10

Electrical Power

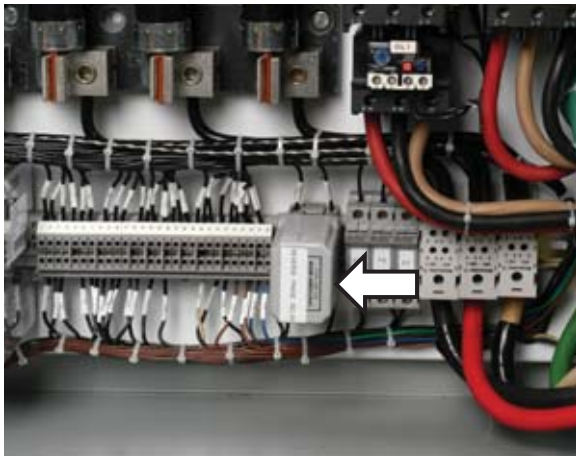
Connect unit to proper electrical power source.

NOTICE: Connections should only be made by a qualified technician.

The reverse phase relay ensures correct rotation of the pump motor so damage to the hydraulic system does not occur.

If unit fails to start, check to see if the light on the reverse phase relay is on. If not, disconnect the power source and switch any two incoming power leads and try again. If the unit still doesn't start and the light is on, call qualified service personnel for assistance.

TX03013-10-12-10



PH03742-1-29-09

Check Hydraulic Fluid

Proper level is indicated on the sight gauge. The level should be checked with cold fluid and with the cylinders fully retracted. Fill reservoir to the HIGH level on the sight gauge. Refer to the "Hydraulic Fluids" section of this manual for hydraulic oil recommendations.

Never allow dirt or other foreign matter to enter the open tank.

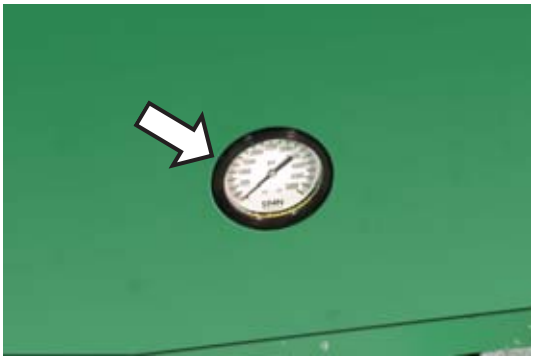
TX02864-8-13-09

PH03748-1-29-09

Hydraulic Pump

Turn on hydraulic pump by pushing start button. Pump pressure gauge reading should be 2800 - 3000 psi. The gauge is located on the rear of the machine below the indexer.

TX02870-10-12-10



PH03756-1-29-09

Setting Unit

Outriggers must be set before operation of the machine. Position the fusion machine on as level ground as possible. Chock the wheel and adjust outriggers to make it as level and stable as possible.

⚠WARNING This machine can tip over if the outriggers are not set before moving the heater and facer out. Set the outriggers before operating this machine to avoid serious injury.

To set the outriggers:

Remove the outrigger feet from storage areas and attach the feet to the bottom of each outrigger cylinder.

NOTICE: Make sure the area underneath each outrigger is clear of any obstructions.

Some of the outriggers must be extended out to provide a wider base. To extend, rotate the handle to retract the pin. Extend the outrigger out and then rotate the handle to lock the pin in place. The outrigger may have to be moved around to enable the pin to snap into place.

Use the outrigger controls on the face of the main electrical box to raise and lower the outriggers.

To stow outriggers for transportation:

Use the outrigger controls and lower the machine and fully retract the outriggers.

Rotate the outrigger locking pin handle and retract the pin. Retract the outrigger in and rotate the locking pin handle to lock the pin in place. The outrigger may have to be moved around to enable the pin to snap into place.

Remove the base plate adapters from outriggers and store them in their storage areas on both sides of the machine.

PH03755-1-29-09

PH03747-1-29-09

PH03747-1-29-09

PH04003-8-25-09

TX02868-8-25-09

Clearances

NOTICE: Moving parts of the fusion machine are subject to clearances, use caution when moving, opening and closing components of the fusion machine. Damage to machine and its components may occur.

TX03014-8-18-09

PH03757-1-29-09

Heater

Move carriage to the right.

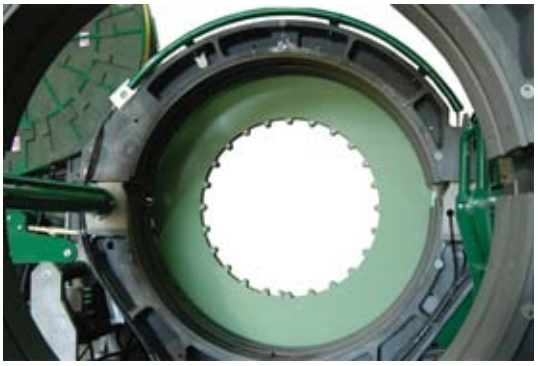
Pivot facer, heater with bag frame outboard by using the switches on the inner fixed jaw control box.

Pull the heater bag frame pin, and return heater to machine to clean. Clean the heater surfaces. Refer to the "Clean Heater Surfaces" in the Maintenance Section of this manual.

Turn heater switch on.

NOTICE: Damage to wiring or facer may result if heater and facer or heater and bag frame are pivoted inboard for an extended period of time while the heater is hot.

TX02900-8-18-09



PH04001-8-25-09

Jaws

Move clamp switch to fully extend clamp cylinders and swing the clamp cylinders toward you. Move jaw valve switch to open position and open jaws.

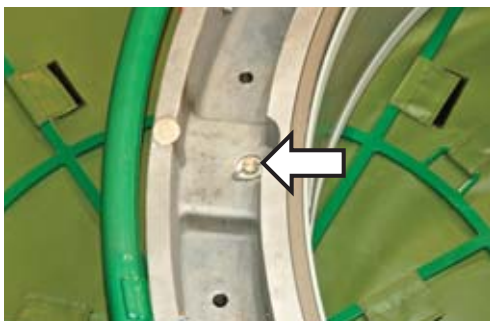
TX02871-1-30-09

PH04000-8-25-09

Jaw Inserts

Install proper size jaw inserts if required. The inserts are held in place by detent pins or by screws

TX02901-1-30-09

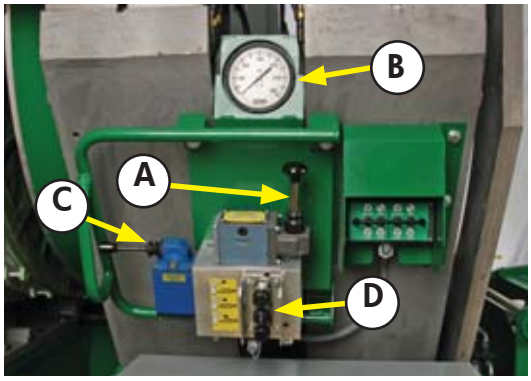


PH03779-1-30-09

Hydraulic Pressure

The pressure gauge above the manifold block indicates the pressure at the carriage control valve. How much pressure depends on the position of the selector valve and the pressure setting of the selected pressure reducing valve.

PH03758-1-29-09



PH03750-1-29-09

A - Carriage Control Valve
B - Pressure Gauge
C - Pressure Selector Valve
D - Pressure Reducing Valves (3)

TX02872-8-19-09

Place Pipe in Jaws


PH00768-3-21-96

Position pipe support stands at each end of the machine to help support and align the pipe.

⚠WARNING Plastic pipe is heavy. If loaded or lifted improperly, it could crush or kill. Handle load carefully with proper rigging and equipment of adequate load rating.

Position pipe with enough material protruding past the jaw faces to allow for facing of the pipe end (Approximately 2.5").

Move the control switches for the jaws to the **Close** position.

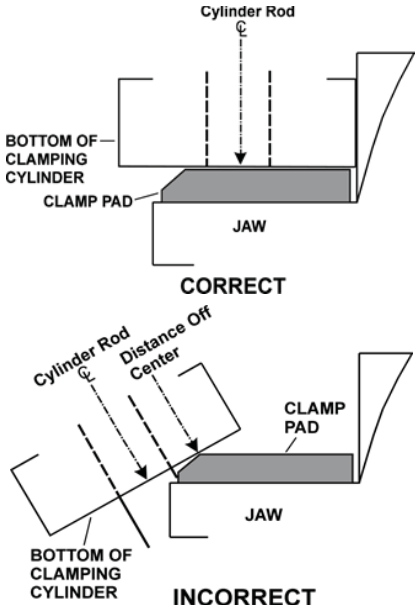
Move the clamping cylinders into the vertical position and then move the control switches for the clamp cylinders to the **Clamp** position.

NOTICE: Ensure that the clamp cylinders do not rotate and do not pinch or rub the hoses.

NOTICE: The jaw clamping cylinders are designed to clamp when in the upright position, evenly applying pressure over the entire base of the cylinder. Always ensure the clamping cylinder is upright over the clamping pad of the jaw before clamping the jaw. Damage to the cylinder and jaw can occur if not clamped properly.

Clamp marks on the bottom of the cylinder are an indication that the cylinder was not in the proper position when clamped down.

TX02874-02-04-14

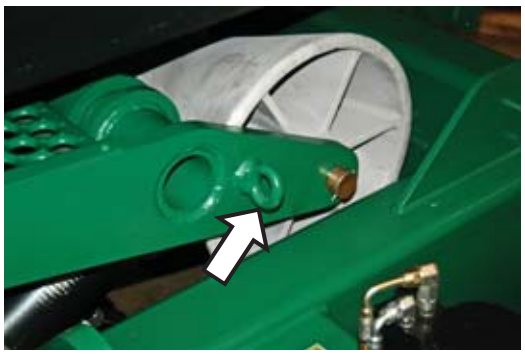


PH04855-3-15-13

PH04855-3-15-13

Using Lifting Roller to Help Load

A section of pipe can be bent or out of round, preventing the jaw clamping cylinders from moving completely into position on top of the jaws. The hydraulics on the lifting roller can help straighten the pipe long enough to get it clamped in the jaws.

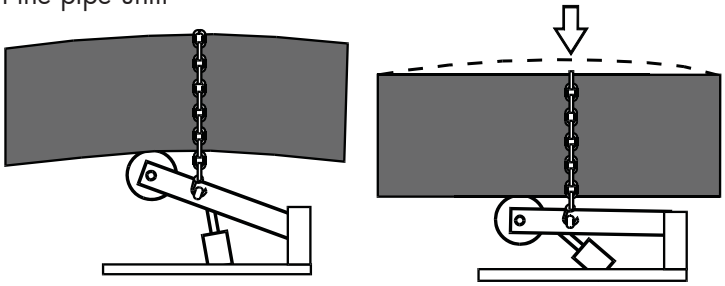

PH03760-1-29-09

Position the pipe in the jaw and move the control lever for the jaw to the **Close** position to apply pressure on the pipe.

Raise the lifting roller up until it just starts lifting the pipe. Put a chain of adequate strength around the pipe and secure to the attachment point on either side of the lifting roller platform.

Tighten the chain as much as possible.

Lower the lifting roller to put downward pressure on the pipe until the jaw can be closed and secured. The process may have to be repeated, tightening the chain as much as possible each time.


CD00309-6-3-96

Once the pipe is securely clamped in the jaws of the machine, raise the lifting roller up to loosen the chain.

Remove the chain.

TX02875-8-18-09

Position Facer

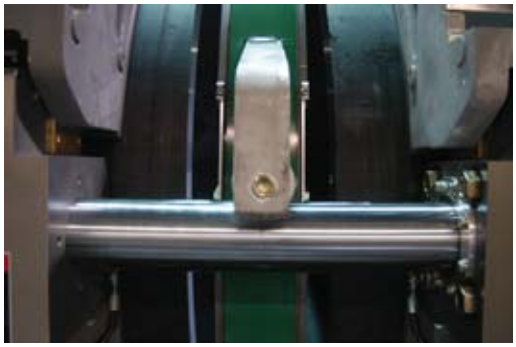
Move carriage control lever to the right to open the carriage fully.

Move the heater/facer index valve switch to center the facer between the pipe ends.

Move the facer into position by activating the facer pivot switch to **IN** position.

NOTICE: Ensure there is adequate clearance between pipe end before pivoting facer. Failure to do so could damage the facer.

TX02876-8-18-09



PH04002-8-25-09

Begin Facing

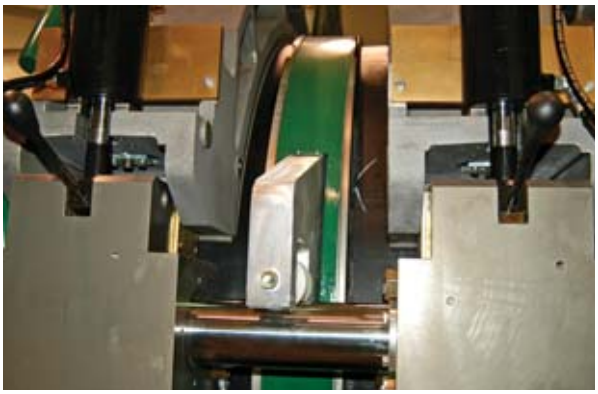
Turn facer motor on using the facer on/off switch located on the controls on the inner fixed jaw.

Move the selector valve on the hydraulic manifold block to the top (facing pressure) position.

The facing pressure should be set as low as possible while still facing pipe. Excessive facing pressure can damage the facer. It may be necessary to adjust the carriage pressure.

Activate the carriage control valve and move the carriage to the left to begin facing. Continue to face the pipe until the rest buttons on the jaws bottom out on the facer rest buttons.

TX02902-8-18-09



PH03761-29-09

After Facing

Turn facer motor off. Move carriage all the way to the right. Center the facer in between the pipe ends to avoid dragging facer stops on the pipe ends. Swing facer to the out position. Clean shavings out of pipe ends and from between the jaws.

⚠WARNING Turn the hydraulics off if it is necessary to enter the unit for maintenance or chip removal. Death or serious injury will result if the hydraulics are activated while in the unit.

TX02877-10-12-10

PH03752-29-09

Determine Drag Pressure

Drag pressure should be determined using the following procedure:

Move the carriage so that the faced pipe ends are approximately 2" apart.

Shift the carriage control valve to the middle (neutral) position.

Select the heating mode, and adjust the middle pressure reducing valve to its lowest pressure by turning the valve counterclockwise.

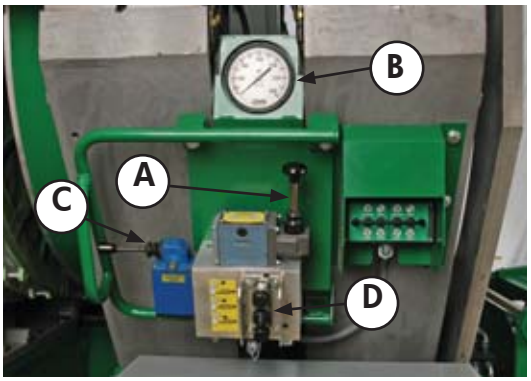
Shift the carriage control valve to the left.

Gradually increase the pressure by turning the valve clockwise. Increase the pressure until the carriage moves.

Quickly reduce the heating pressure valve counterclockwise until the carriage is just barely moving.

Record this actual drag pressure.

TX03023-8-19-09



PH03750-1-29-09

A - Carriage Control Valve
B - Pressure Gauge
C - Pressure Selector Valve
D - Pressure Reducing Valves (3)

Set Fusion Pressure

With the selector valve in the down position, the fusion pressure can be set.

The theoretical fusion pressure can be calculated using the enclosed fusion pressure calculator. Always add drag pressure to the theoretical fusion pressure.

Gauge (Fusion) Pressure = Theoretical Fusion Pressure + Drag Pressure

TX03024-10-19-10

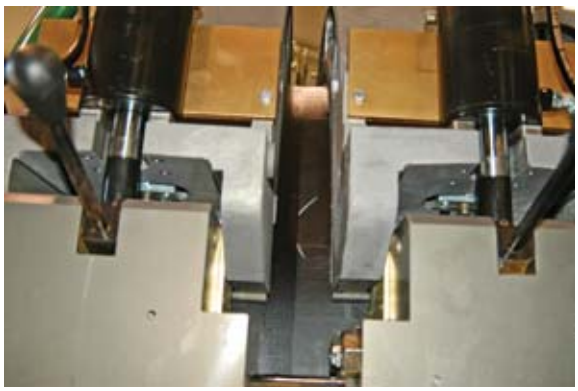
PH04004-8-25-09

Check for Slippage

Bring the two sections of pipe together under fusion pressure to make sure they don't slip in the jaws.

If slippage occurs, the pipe will have to be reloaded in the jaws and the facing procedure repeated.

TX00971-5-31-96



PH03762-1-29-09

Check Alignment

Move carriage to the left at facing pressure, until pipe ends contact. Look across the top surface of pipe ends to check alignment. If there is a noticeable step across the joint, adjustments must be made.

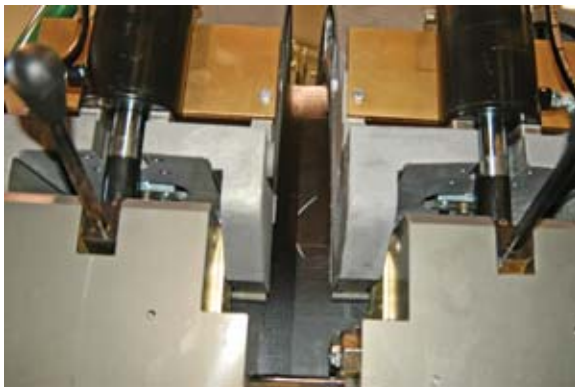
Adjusting screws are located on top of both jaws. The jaws must be opened to perform the adjustment.

Turn the bolt on the high side jaw counter-clockwise to improve alignment.

IMPORTANT: Always tighten the side that is higher, never loosen the low side.

⚠WARNING Hydraulically operated equipment is operated under pressure. Anything caught in the machine will be crushed. Keep fingers, feet, arms, legs, and head out of the machine while operated.

TX02878-8-18-09



PH03762-1-29-09

PH03763-1-29-09

Position Heater

Move the carriage to the right, leaving about a 5" gap between pipe ends.

Clean the surfaces of the heater with a non-synthetic cloth.

Activate the heater/facer index switch and move the heater to center on gap.

Move heater pivot switch to the **IN** position and swing heater into position. Ensure that heater temperature is correct.

Use the indexing switch to move the heater left until it almost contacts pipe.

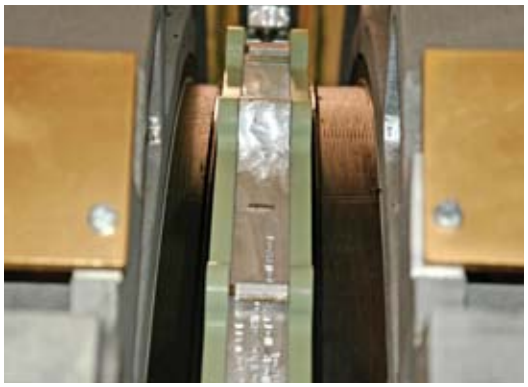
NOTICE: Don't contact the end of the pipe ends while indexing the heater and facer. Damage to heater arm or splice plates may occur.

NOTICE: Do not hold down indexer switch for extended periods, the switch also activates the heater stripping cylinders. Indexing while stripping cylinders are extended could damage the heater and splice plates.

TX02879-8-18-09

PH03764-1-29-09

Heat Pipe


PH03765-1-29-09

Shift the selector valve to the center position, and set the heating pressure (if required). If heating pressure is not required, set the pressure reducing valve at its lowest setting, or the drag pressure, whichever is higher.

Shift the selector valve to the fusion position and move carriage to the left to bring pipe ends in contact with the heater. Move selector valve to middle (heating mode) position. If heater pressure is not required by pipe manufacturer or joining standard, or opposing forces are not great enough to move the carriage away from the heater, shift the carriage control valve to neutral.

IMPORTANT: Always shift into the heating mode **before** returning carriage valve to neutral.

Follow the pipe manufacturer's suggested heating and soaking procedure or joining standard.

TX02880-10-12-10

Fusing the Pipe

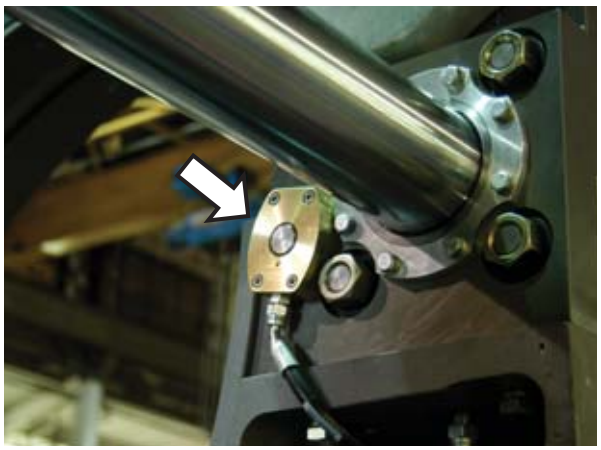

PH03766-1-29-09

After following the heating procedure, verify carriage control valve is in neutral and move selector valve down, to fusion position.

The machine is equipped with stripping cylinders, which when activated by the indexing switch, strip the heater from the pipe.

Move the carriage to the right just enough to remove the heater.

IMPORTANT: If the heater does not strip off the pipe end, continue to open the carriage and move the indexing carriage in the appropriate direction to activate the stripping cylinders to strip the heater off of the pipe end.


PH03993-8-25-09

Index the heater to the right to clear the pipe ends. Move the heater pivot switch to **OUT** position to quickly pivot heater out.

Quickly inspect pipe ends for appropriate melt.

When heater is clear of the jaws, quickly move the carriage to the left and bring the pipe ends together using the pipe manufacturer’s recommended pressure.

Allow joint to cool under pressure according to pipe manufacturer’s recommendations or appropriate joining standard.

Visually examine the entire circumference of the joint for compliance with standards established by your company, customer, industry, federal, state, or local regulations.

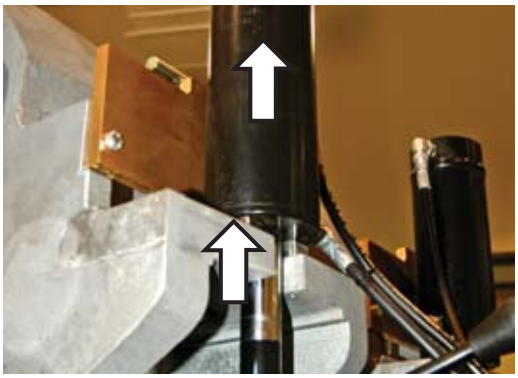
TX02881-10-12-10

Opening Movable Jaws

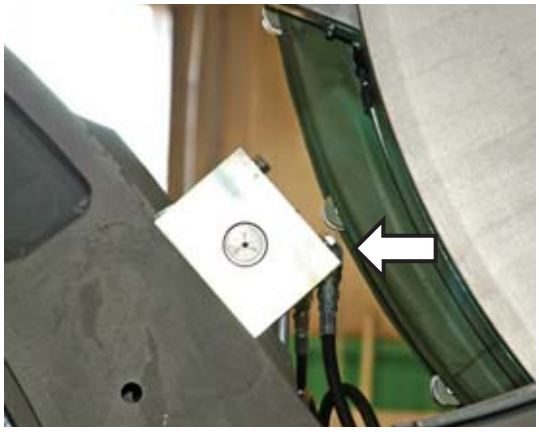
Move the heater and facer to the left. Switch the movable jaws to open, unclamp the clamp cylinders enough to allow the jaws to slip on the pipe. Move the carriage to the right.

NOTICE: Watch facer and heater to make sure they clear the movable jaw pivot cylinder. Trunnion blocks may not clear the heater and facer if the clamp cylinder is fully extended.

Close the movable jaws, fully extend the clamp cylinders and swing the clamp cylinders out, then open the movable jaws.



PH03767-1-29-09



PH03768-1-29-09

PH03757-1-29-09

TX02882-10-12-10

Opening Fixed Jaws

Move the heater and facer all the way to the right

Unclamp and open fixed jaws.

PH03770-1-29-09

TX02883-1-30-09

Raise Pipe

Raise the pipe lifts, using the pipe lift control switch, until the pipe and bead clears the lower jaws.

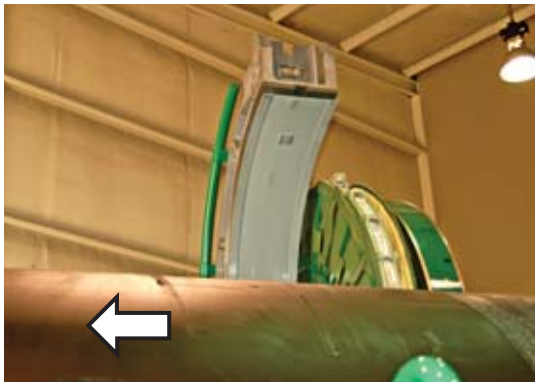
PH03771-1-29-09

TX02884-8-18-09

Position Pipe for Next Joint

Pull the pipe through the machine until the end of the pipe protrudes about 2.5" to the right of the inner fixed jaw face.

Close fixed jaws and clamps.



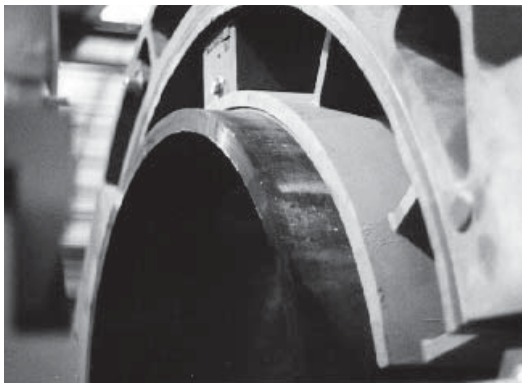
PH03770-1-29-09

TX03015-10-12-10

Install Next Piece of Pipe

Position new piece of pipe in the movable jaw and leave approximately 2.5" of material protruding outside the jaw face to allow for face-off. Close the movable jaws and clamp the pipe.

Repeat operating procedures.



PH00770- 3- 21-96

TX03016-8-18-09

Lifting Fusion Machine

Lifting Safety

SAFE1st- 12-14-92

WR00014-3-8-93

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

This spreader bar may only be used to lift the McElroy 1600mm Fusion machine. It is not designed for general purpose lifting.

It must only be operated by a person trained and qualified in its use.

It can be lifted in two distinct ways:

With a single lift (13 ton minimum), from the center lift point.

With two matched lifts (6.5 ton lift minimum) from the end lift points.

When using two lifts, take care to keep load level while lifting.

Safety warnings:

1. Do not exceed rated load or lift loads other than the McElroy 1600mm fusion machine.
2. Do not operate a damaged or malfunctioning spreader bar, or one missing parts.
3. Do not lift persons.
4. Do not lift a suspended load over persons.
5. Do not leave a suspended load unattended.
6. Do not remove or obscure warning labels.
7. Read and understand the operator's manual before using the device.
8. Stay clear of the suspended load.
9. Lift loads only as high as necessary.
10. Do not alter or modify the spreader bar.
11. Employ generally accepted safe lifting practices
12. Do not shock or impact load the spreader bar.

TX02886-8-18-09

Lifting Fusion Machine

Spreader Bar

Ensure that the spreader bar is attached correctly before lifting.

Inspect the spreader bar for damage prior to each use.

For maintenance, inspection and service instructions refer to section "Spreader Bar" in the Maintenance section.

TX02885-1-30-09

PH03772-1-29-09

Attach to Lifting Eyes

Attach the hooks on the bar slings to the front lifting eyes on the machine. Attach the hooks on the other end of the spreader bar to the lifting eyes on the back of the machine.

TX02903-1-30-09

PH03772-1-29-09

Lift Machine

Using proper overhead rigging and equipment of adequate load rating, lift the fusion machine.

The spreader bar and 1600mm fusion machine without inserts weighs a combined total of 22,000 lbs.

The lifting points are designed such that the spreader bar can be lifted with a single point lift or with dual lifting devices.

TX02887-8-18-09

PH03772-1-29-09

Transport Machine

Storing and Transport Machine

Before transport the machine must be in storage/ transport state.

Turn off heater and allow time to cool.

Pivot the heater into the bag and pin the heater into the heater bag.

Close and clamp jaws.

Open carriage and pivot heater and facer in between the fixed and movable jaws. Use a strap to secure the facer and heater to the guide rod of the machine. Use caution not to damage the guide rod, heater or facer. Slowly close the carriage until the jaws touch the facer stops.

Raise and retract outriggers. Place outrigger base plates in storage areas.

Lower hydraulic pipe lifts.

Unthread clamp cylinder handles and stow in toolbox.

Unplug power cord and coil on top of the front pipe lift.

Secure clamp cylinder hoses, heater cord and power cord to the machine.

Once machine is hitched to towing vehicle, remove wheel chocks and stow in the outrigger base plate storage area.

Keep wheel chocks in place on a rear tire when storing the machine. Remove wheel chocks only when towing and when the tow bar ring is securely attached to towing vehicle. Stow wheel chocks in the outrigger base plate storage area while towing.

TX03026-11-09-16

Towing

Ensure machine is in the storage/transport state.

The machine towing speed limit is 5 mph.

NOTICE: The machine is not designed for high speed towing. Attempting to tow the machine at high speeds can result in machine damage. Always transport the machine by flat bed truck or similar means, and make sure that unit is properly secured.

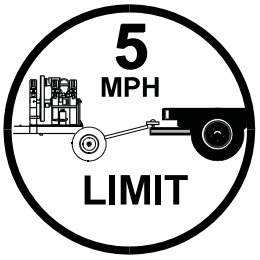
Connect the towing ring (**A**) to the tow vehicle

NOTICE: Connect the machine to the tow vehicle before removing the wheel chocks.

Connect the two tow chains to the towing vehicle by crossing them through the chain ring (**B**) on the tow bar.

If there is no place to connect the tow chains, connect them to the towing ring of the tow bar (**A**).

NOTICE: Do not turn fusion machine against the turning stops as machine and the towing vehicle damage can occur.



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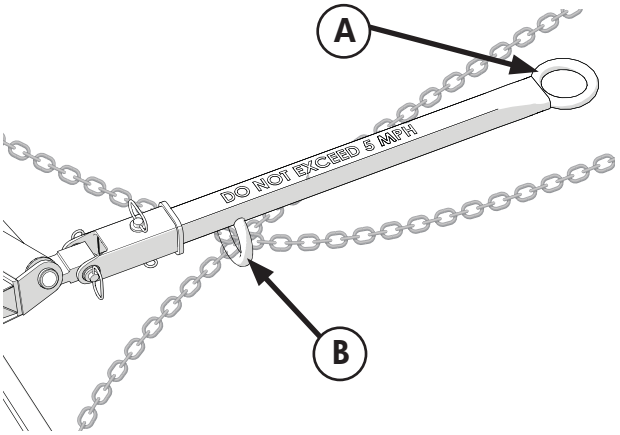

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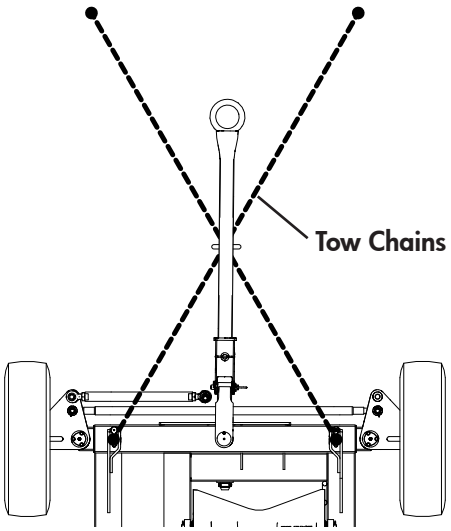


CD01853-11-09-16

TX05192-11-09-16

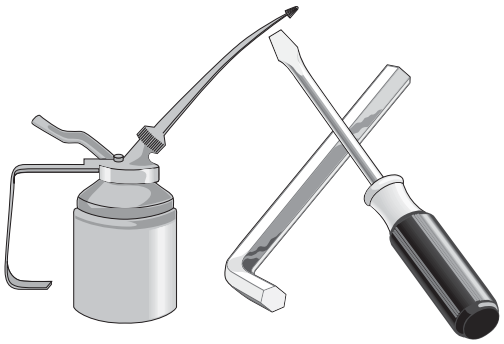
Maintenance

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.



CD00142-11-2-94

TX00428-8-10-95

Disconnect Electrical Power

⚠WARNING Always disconnect unit from electrical power source before beginning any maintenance to avoid the risk of electric shock

Cover plug and electrical control box before washing.

WR00055-4-7-93

TX00742-11-3-95

Washing the Machine

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

Do not pressure wash.

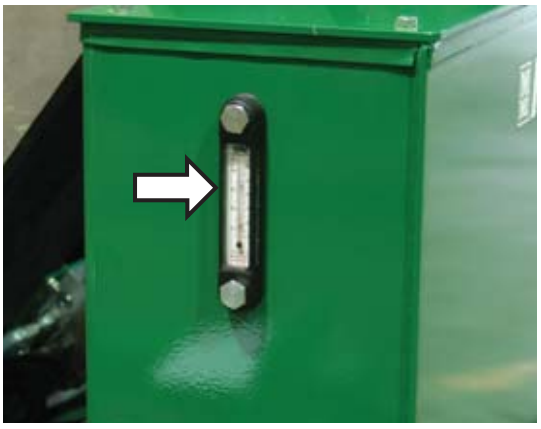
CD00178-9-15-95

TX00429-04-28-14

Check Hydraulic Fluid

Proper level is indicated on the sight gauge. The level should be checked with cold fluid and with all cylinders fully retracted. Fill reservoir to the HIGH level on the sight gauge. Refer to the "Hydraulic Fluids" section of this manual for hydraulic oil recommendations.

Never allow dirt or other foreign matter to enter the open tank.



PH03998-8-25-09

TX02864-8-13-09

Hydraulic Fluid and Filter

The hydraulic fluid and filter should be replaced after every 500 hours or when the gauge is not green. The magnetic suction filters inside the reservoir should also be disassembled and cleaned. Use compressed air to remove contamination from the magnetic elements.

Fluid should also be changed as extreme weather conditions dictate. There is a drain plug on the hydraulic reservoir.

Refer to the "Hydraulic Fluids" section of this manual for hydraulic oil recommendations.

TX02889-10-19-10

PH03749-1-29-09

Hydraulic hoses

With the machine off, inspect all hoses and replace those that show wear.

TX03017-8-18-09

PH00771- 3- 21- 96

Grease

Lubricate the following points monthly with grease rated for high temperature service.

- ❏ Pivot cylinder trunnion block
- ❏ Jaw pivot pins
- ❏ Tie rod ends and steering arm ends
- ❏ Kingpin bushings and thrust bearings
- ❏ Pipe lift rollers (front and rear)
- ❏ Facer pivot pin
- ❏ Heater pivot pin

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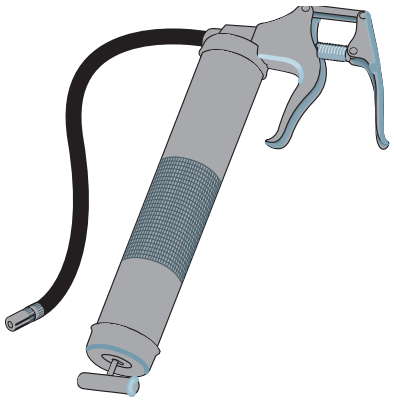


CD00183-11-6-95

Fasteners Must Be Tight

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

NOTICE: Cylinder tie rods have a specific torque specification and sequence. Check assembly procedures before tightening or loosening these specific fasteners.

TX03018-8-18-09

PH03774-1-29-09

Facer

The facer is lubricated and then sealed at time of assembly and should not require further lubrication.

TX00895-3-21-96

PH03992-8-25-09

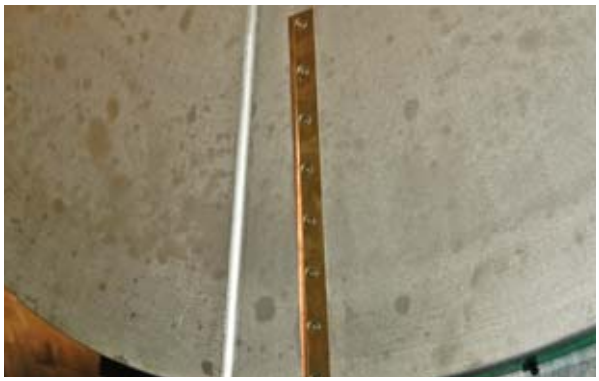
Facer Blades

Blades bolt directly to the blade holder and should be inspected for damage and sharpness.

Dull or chipped blades must be replaced.

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

TX02475-3-29-05



PH03775-1-29-09

Tire Pressure

Air pressure in tires should be maintained at 114 psi (8.0 bar).

TX02904-8-18-09

PH03776-1-29-09

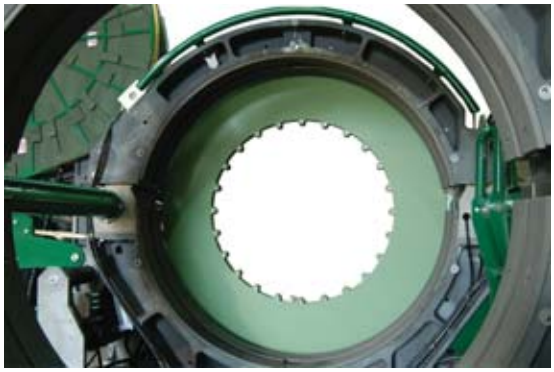
Clean Heater Surfaces

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



PH04001-8-25-09

Clean Jaws

To prevent slippage and ensure proper alignment, remove any dirt and residual build-up from the jaw and insert serrations using a stiff bristle brush.

TX00809-12-13-95

PH03757-1-30-09

Hydraulic Cylinder Cushion

Most hydraulic cylinders are equipped with a cushion which slows the motion of the cylinder near the end of the stroke to protect components from impact damage. There is a screw near either end of the cylinder opposite of the ports, to adjust the cushion.

To adjust, open the jaw, turn small screw in center.

TX02891-8-18-09

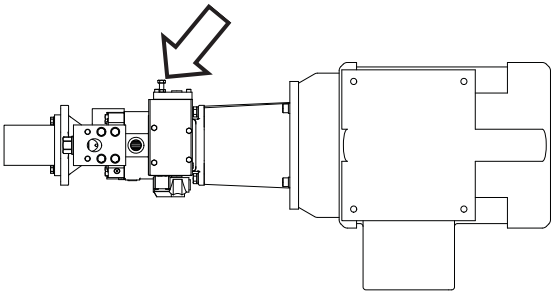
PH03777-1-29-09

Adjusting System Pressure

The hydraulic pump is factory set at 2800 - 3000 psi. If adjustment is required, start the pump running and the system deadheading with no motion occurring. Loosen the locknut on the pressure adjusting screw and turn it clockwise to increase the pressure. Watch the pressure gauge located at the rear of the machine below the indexer and retighten the locknut on the adjusting screw when the desired pressure is reached. Readjust the fusion pressure reducing valve to the required fusion pressure.

NOTICE: The electric motor can be overloaded and trip the overload switch if the pressure is set too high. If the overload switch trips and turns off power to the motor, the pressure must be decreased.

The overload switch is located inside the control box. Push the reset button on the overload switch after making adjustments.



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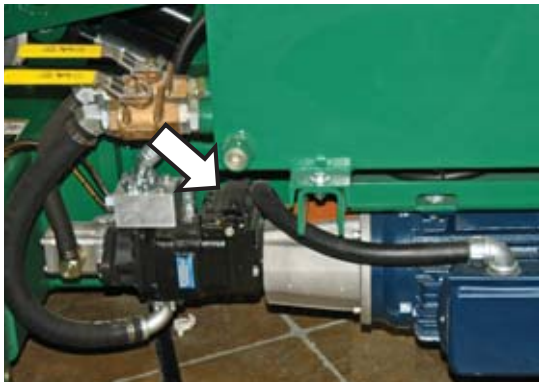

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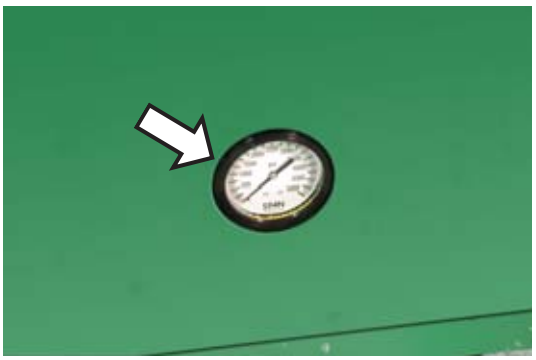

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To Bleed Hydraulic Carriage

Use outriggers to tilt unit so the fixed jaw end is higher than the opposite end.

Shift the directional control and move the carriage to the fixed jaw end. Adjust the pressure to approximately 50-100 psi.

Loosen the bleed plug on one cylinder next to the fixed jaw.

Hold pressure on the cylinder until no air is indicated and quickly retighten the plug.

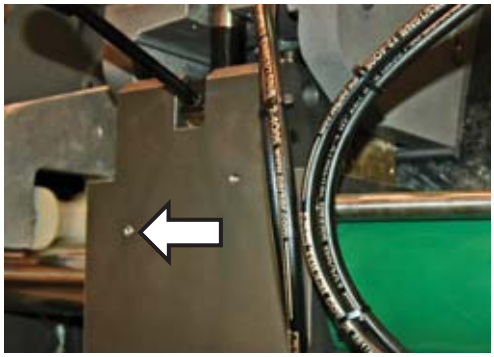
Repeat bleeding operation on the opposite cylinder.

Tilt the unit so the opposite end is higher than the fixed jaw end.

Move the carriage to the end opposite the fixed jaw end.

Repeat the bleeding procedures for the remaining cylinders.

TX03019-8-18-09



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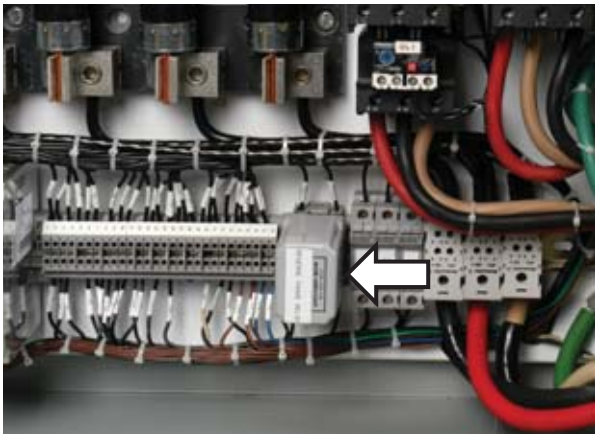
If Unit Fails to Start

Check electrical source to make sure it is sufficient for your machine.

Inspect fuses inside electrical box. Replace as required.

NOTICE: Low voltage will damage unit. Using the phase selector switch and observing the volt meter on the control panel, check voltage at each of the three phases.

NOTICE: If unit fails to start, check to see if the light on the reverse phase relay is on. If not, disconnect the power source and switch any two incoming power leads and try again. If the unit still doesn't start and the light is on, call an authorized service center for assistance. The reverse phase relay ensures correct rotation of the pumps so damage to the hydraulic system does not occur.



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TX00810-12-13-95

Spreader Bar


PH03772-1-29-09

Inspection

Every lift, prior to lift:

Inspect lifting points on chassis for:

- Damage
- Permanent set/yielding
- Cracks
- Rust

Inspect spreader bar for:

- General Damage
- Rust/chemical damage
- Cracks
- Paint flaking or other signs of oxidizing/deteriorating material or weld below
- Permanent "set" or yielding in the spreader bar indicating overload
- Damaged or bent lift points
- Missing or illegible sling identification

Check for missing or damaged hardware:

- Bolt shackles in good shape, nut and retainer pin present and in good shape.
- Hooks in good shape, no permanent deformation or excessive wear.
- Hook safety latch.

Ensure wire rope sling in good condition, particularly around crimp/thimble:

- No birdcaging, kinking, crushing, excessive wear, corrosion, excessive elongation
- No evidence of heat damage
- No evidence of slippage or breakage/damage around crimp/thimble
- No knots in sling

⚠CAUTION Broken strands can pierce or slice skin. Inspect for broken strands visually, not by running hands up and down wire rope.

Maximum two broken wires per lay or 10 randomly distributed broken wires through the rope section. If these limits are exceeded, the spreader bar must be removed from service and repaired and recertified prior to lift

Repair/replacement:

McElroy does not certify nor warrant third party repairs to our spreader bars. Any damaged spreader bar can be sent back to McElroy for repair. If the spreader bar assembly can made safe for use, it will be repaired, proof tested and recertified.

Maintenance schedule/storage instructions:

The spreader bar assembly must be inspected yearly by a qualified person and records of the inspection maintained. Any hazardous condition uncovered by this inspection must be corrected before the normal operation of the lifting bar is resumed.

Do not store or use in a location with chemicals present as solids, liquids, gases, vapors, or fumes. McElroy or a competent person should be consulted before using the spreader bar in such an environment

Store in a location where slings will not be subject to mechanical damage, corrosive action, moisture, extreme temperatures or kinking.

Lubricate wire rope sling using a lubricant that is appropriate for XIP IWRC wire rope, at a minimum of once a year. Do not use grease or any other lubricant that is not approved for use with wire rope slings.

TX02896-10-12-10

Fuji Model PXR3 Temperature Controller Setup

Setting the heater temperature

Turn the heater on and press the SEL key to display the SV (Setting Value). The SV indicator lamp will be illuminated. Press the ▲ (UP) or ▼ (DOWN) arrow keys until the desired heater temperature setting is displayed. The new value will be registered in the SV after three seconds. Thereafter, the controller will operate using the new SV value.

PH03996-8-25-09

Checking the heater with a pyrometer

Each day the operator should check the surface of the heater to see that the PV (Process Value) reading on the controller agrees with the actual surface temperature. When the heater has come up to operating temperature, use a pyrometer to read the actual heater butt plate surface temperature. Be sure to allow enough time after the heater is turned on for the surface to stabilize. If a discrepancy is detected and the difference is consistent, the operator can modify the controller bias setting as described below.

Adjusting the Controller Bias Setting

Press and hold the SEL key for approximately 6 seconds until the PVOF (PVOF) parameter is displayed. Press the SEL key once to display current offset. Use the ▲ (UP) and ▼ (DOWN) arrow keys to adjust the setting to the desired offset value. To increase the heater surface temperature, the offset should be a negative (-) number. Press the SEL key once and PVOF (PVOF) will be displayed and the new offset value will be added or subtracted from the SV setting. Press the SEL key for two seconds, to return to the SV setting. After approximately thirty seconds the display will return to the PV reading.

Perform Auto-Tune

Auto-tuning determines the PID values (proportional band, intergral time and derivative time) for optimum heater performance. Press and hold the SEL key for approximately 3 seconds. AT (AT) will be displayed. Press the SEL key once. Use ▲ (UP) key to change AT (AT) to 1. Push SEL key once to accept the new AT (AT) value. The unit will begin auto-tuning. The lamp at the bottom right of the display will flash until auto-tuning is complete. AT (AT) value will automatically be reset to 0.

The Fuji Model PXR3 temperature controller has many customizable settings. For more information about the controller or to download a complete operations manual, visit the website www.instrumart.com and type Fuji PXR3 in the search box.

Maintenance Checklist

Fusion Machine Checklist

Item to Check	Satisfactory	Needs Repair	Repair Comments
Machine is clean			
Hydraulic reservoir is filled to correct level			
Hydraulic gauges read correctly			
Hydraulic cylinders are free of leaks			
All pivot points lubricated)			
All hydraulic cylinders are adjusted:			
• Cushion			
• Speed			
• Travel distance			
All hydraulic hoses free of leaks and in good condition			
Heater and facer secured to support arms and in alignment with jaws			
All hardware is with unit (inserts and pins, etc.)			
Tow bar is in good condition			
Tire pressure correct			
Inserts fit and pin properly			
All rest buttons are on facer			
Rest buttons are on inner movable and inner fixed jaw			
Pipe lift and roller lubricated and in good condition			
Jaws are aligned properly			
Pump pressure is set correctly: • 2800 - 3000 psi			
Power cord and plug in good condition			
Spare fuses in electric control panel			
All hydraulic valves and pressure reducing valves function well			
All nuts and bolts are tight			
Generator in good condition and voltage output correct.			
All wiring in good condition and functions properly			
Heater surface is clean and in good condition			
Thermometer is in good condition			

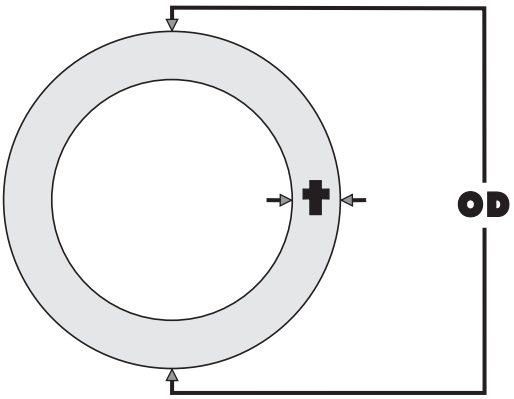
LIfting: The spreader bar is not serviceable. If components are damaged, send to McElroy for repair or recertification.

TX02892-1-30-09

Determining Fusion Pressure

Variable Definitions

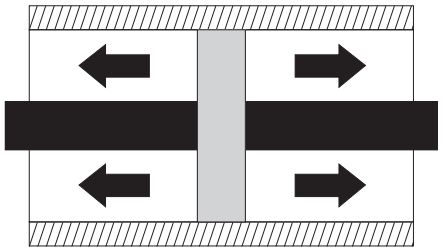
O.D. = Outside Diameter of Pipe (inch)
t = Wall Thickness of Pipe (inch)
$\prod$ = 3.14
SDR = Standard Dimensional Ratio of Pipe (unitless)
IFP = Interfacial Pressure of Pipe (PSI)
TEPA = Total Effective Piston Area of Carriage Cylinders (inch^2)



Formulas

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

PIPE AREA = (O.D. - t) x t x $\prod$
FUSION FORCE = AREA x IFP



$$\text{GAUGE PRESSURE} = \frac{\text{FUSION FORCE}}{\text{TEPA}} + \text{DRAG}$$

Example

Pipe Size = 8" IPS, SDR 11
O.D. = 8.625 inch
DRAG = as measured in PSI (for this example use 30 PSI)
Recommended IFP = 75 PSI
Using a Model 28 High Force Fusion Unit

$$t = \frac{O.D.}{SDR} = \frac{8.625}{11} = 0.784$$

TEPA = 4.71 (From Table)

$$\text{GAUGE PRESSURE} = \frac{(O.D. - t) \times t \times \prod \times IFP}{TEPA} + \text{DRAG}$$

$$\text{GAUGE PRESSURE} = \frac{(8.625 - .784) \times .784 \times 3.14 \times 75}{4.71} + 30 \text{ PSI} = 338 \text{ PSI}$$

Total Effective Piston Areas (in^2)

Fusion Model	High Force	Medium	Low Force
A160/A180	-	-	0.90
A250	1.66	-	0.90
28	4.71	3.24	1.66
250	4.71	3.24	1.66
412	11.78	6.01	3.14
618	11.78	6.01	3.14
500	-	6.01	3.14
824/T630	29.44	15.32	9.43
1236/T900	29.44	15.32	9.43
1648/T1200	31.42	14.14	-
2065	31.42	-	-
1600	31.42	14.14	-
2000	32.99	-	-

TX02893-04-18-16

Hydraulic Fluids

The use of proper hydraulic oil is mandatory to achieve maximum performance and machine life. Use a clean, high quality, anti-wear hydraulic oil with a viscosity index (VI) of 135 minimum. It should have a maximum viscosity of 500 cSt (2000 SSU) at startup (ambient temperature) and a minimum viscosity of 13 cSt (65 SSU) at the maximum oil temperature (generally 80°F above ambient). Using hydraulic oils that do not meet these criteria may cause poor operation and/or damage to the hydraulic components.

The following table specifies the oil temperature at various viscosities. Temperature rise of the hydraulic oil can vary from 30° F to about 80° F over the ambient temperature depending on the pressure setting, age of the pump, wind, etc. Mobil Univis N46 hydraulic oil is installed at our factory. The advantage of this oil is a wider temperature range, however, this oil should not be used for continuous operation below 24°F.

NOTE: The Mobil DTE 10 Excel series replaced the DTE 10M Series. The Exxon Univis N series are now Mobil Univis N.

Hydraulic Fluids Characteristics

Manufacturer	Fluid Name	cSt 100F	cSt 210F	V.I.	-20F -10F 0F 10F 30F 50F 70F 90F 110F 130F 150F	Range °F	Range °C
Mobil	10 Excel 15	15.8	4.1	168	**********	-16 - 113	-27 - 45
	10 Excel 32	32.7	6.6	164	**********	12 - 154	-11 - 68
	10 Excel 46	45.6	8.5	164	**********	23-173	-5 - 78
	10 Excel 68	68.4	11.2	156	**********	37-196	3 - 91
	Univis N-32	34.9	6.9	164	**********	12-150	-11 - 66
	Univis N-46	46	8.5	163	**********	24-166	-4 - 74
	Univis N-68	73.8	12.1	160	**********	39-193	4 - 89

TX03082-2-23-10

NOTE: This chart is based on pump manufacturer recommendations of 13 to 500 cSt.

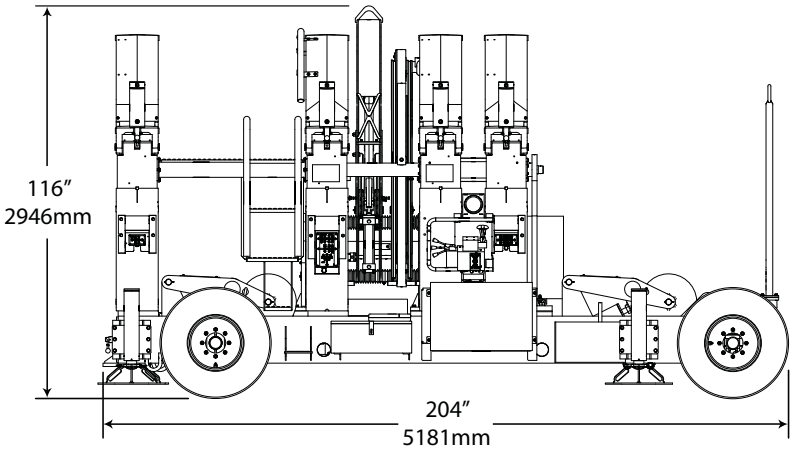
NOTE: Temperatures shown are fluid temperatures. – NOT ambient temperatures.

Specifications

1600mm Fusion Machine Specifications

Dimensions

Length: 204" (5,181mm)
Width: 101.8" (2,586mm)
Overall Height: 116" (2,946mm)



Fusion Machine Weight

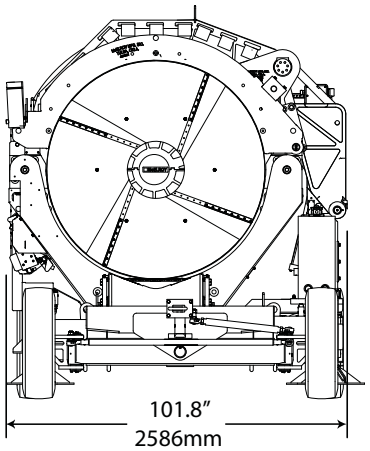
Total Vehicle Weight: 21,000 lbs (9,525 kg)
Spreader Bar Weight: 1,000 lbs (453.5 kg)
Facer: 1,200 lbs (544 kg)
Heater: 20-48" - 600 lbs (272 kg)
48-65" - 713.5 lbs (317 kg)

Carriage Specifications

Maximum Pipe Diameter: 65" OD (1600mm)
Minimum Pipe Diameter: 20" IPS (508mm)

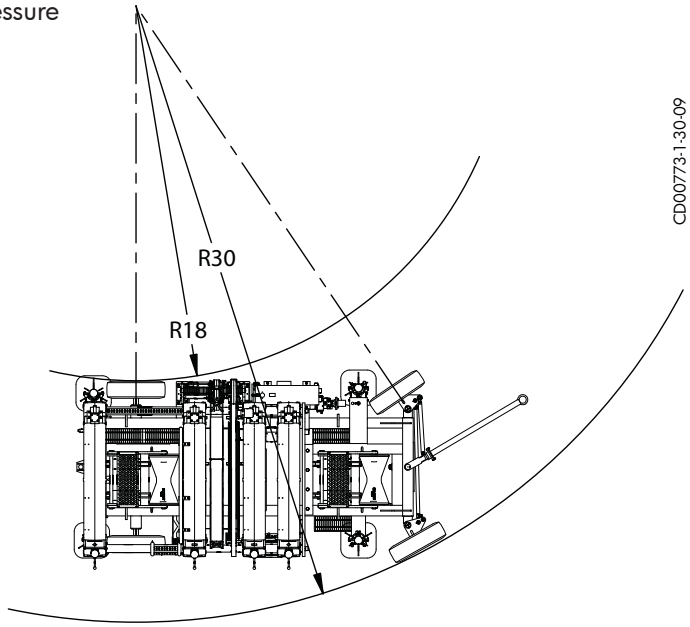
High Force Effective Piston Area: 31.42 sq in (202.7 sq cm)
Maximum Force: 94,260 lbs (42,756 kg)

Medium Force Effective Piston Area: 14.14 sq in (91.2 sq cm)
Maximum Force: 39,592 (17,996 kg)



General Specifications

Motor: 25HP, 3 Phase, 240V, 60Hz
Minimum Power Requirement*: 65KVA
35 gal (132.5 liters) Hydraulic Reservoir Capacity
2,800 to 3,000 PSI (193 to 206 bar) Operating System Pressure
Tires: 8.25-15LT High Load Rating
Heater Power: 20-48" - 35,000 Watt
48-65" - 38,437 Watt
Front Axle: Articulating
Transportation: Pulled via towing ring
DataLogger Compatible



CD00773-1-30-09

Turning Radius

* Average values at sea level

TX02894-10-12-10

Generator Sizing Form

Complete this form and provide a copy to your generator supplier. This information will enable your generator supplier to correctly size a generator for your application.

Motor: 25.0 Horsepower

Motor Code Letter: __H___ (from motor nameplate)

Motor Voltage: ___240 VAC___

Motor Phases: 3 Delta

Motor Frequency: _____ (50 or 60 Hz)

Heater Wattage Rating: 38,437 Watts resistive.

Heater Voltage: _220-240 VAC_

Operational Altitude Range: _____ to _____

Ambient Temperature Range: _____ to _____

Duty Cycle: Standby (Not continuous 24 hours/day)

Allowable Voltage Dip: 20%

Allowable Frequency Dip: 5%

Starting Load Application: Required motor starting load.

Running Load: Motor Continuous, Heater cycling on and off at approximately 5 minute intervals.

Fuel: _____ (Gasoline or Diesel)

Special requirements for customer application:_____

_____

_____

_____

_____

_____

_____

_____

TX02895-8-26-09

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

McELROY
P.O. Box 580550 Tulsa, Oklahoma 74158-0550, USA
www.mcelroy.com