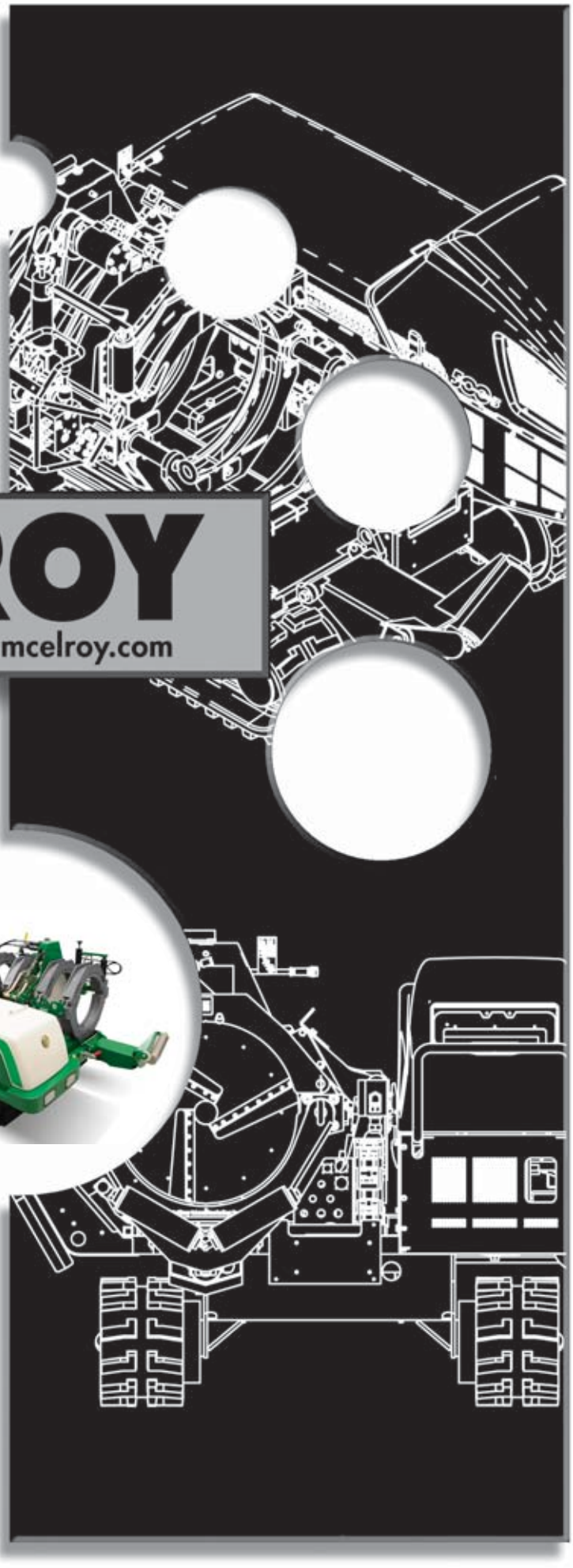
Operator's Manual



McELROY

www.mcelroy.com

TRACSTAR 500 SERIES 3

Fusion Machine

Original Language: English

Manual: T5019210 Revision: Rev C 11/18

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

⚠ WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to www.P65warnings.ca.gov/diesel.

8163362

Introduction

Thank You for purchasing this McElroy product

The TracStar® 500 series 3 is a self-contained, self-propelled, all terrain fusion machine, and is designed to produce consistently high quality polyolefin pipe butt fusion joints with a minimum of operator effort.

The TracStar® 500 series 3 fuses 6" IPS (180mm) minimum to 20" IPS (500mm) maximum pipe.

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.

Always return the manual to the literature compartment.

TX04535-10-24-12

McElroy University

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

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

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

SINCE 1981
McELROY UNIVERSITY℠

MU203-13-14

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.

TX02486-11-4-13

DISCLAIMER OF LIABILITY

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

McElroy makes no other warranty of any kind whatever, express or implied; and all implied warranties of merchantability and fitness for a particular purpose which exceed the aforestated obligation are hereby disclaimed by McElroy.

PRODUCT IMPROVEMENT

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

INFORMATION DISCLOSED

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

PROPRIETARY RIGHTS

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

LAW APPLICABLE

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

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

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

Model No. _____

Serial No. _____

Date Received _____

Distributor _____

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TX04540-05-05-14

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Fusion Equipment Safety

Safety Alerts

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

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

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

SAFE1ST-1222-92

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

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

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

FEEL any changes in the way the equipment operates.

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

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

TX00114-4-22-93

Wear Safety Equipment

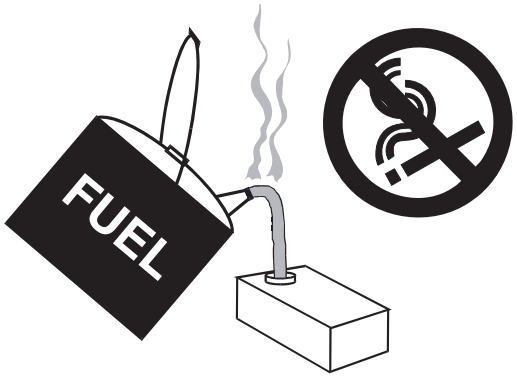
VR00053-122-92

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

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

TX00032-4-7-93

Fuel Handling



CD00365-2-19-97

⚠ DANGER Gasoline and diesel fuel are extremely flammable and their vapors will explode if ignited.

Do not fill the fuel tank while the engine is hot or running, as spilled fuel could ignite.

Refuel in a well ventilated area. Do not smoke or allow flames or sparks in the area where the engine is refueled, or where gasoline is stored.

Do not start the engine near spilled fuel. Wipe up spills immediately.

Maker sure the fuel tank cap is closed and properly secured.

NOTICE: Avoid repeated or prolonged contact with skin or breathing of vapor.

TX00953-3-30-11

Fusion Equipment Safety

Units With Engines

⚠ DANGER Combustion engines can cause explosions when operated in an explosive atmosphere. Do not operate gas or diesel powered machines in an explosive atmosphere.

When operating in an explosive atmosphere, keep engine and chassis in a safe area by using hydraulic extension hoses.

Help prevent fires by keeping machine clean of accumulated trash, debris and facer shavings.

TX04466-05-05-14

WR00080-4-12-93

Carbon Monoxide

⚠ DANGER Engine exhaust gases contain poisonous carbon monoxide. Carbon monoxide can cause severe nausea, fainting and death. Avoid inhaling exhaust fumes and never run the engine in a closed or confined area.

TX00954-5-14-96

WR00093-5-14-96

Heater is Not Explosion Proof

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

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.

TX04467-03-24-14

WR00034-11-30-92

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.

TX03004-8-11-09

WR00012-12-4-92

Fusion Equipment Safety

Battery

⚠WARNING Do not expose the battery to flames or electrical sparks. Hydrogen gas generated by battery action is explosive. Blindness or serious injury can result from an exploding battery.

CD00176-9-14-95

⚠WARNING Do not allow battery fluid to contact your skin, eyes, fabrics, or painted surfaces. Sulfuric acid can cause burns. After touching a batter or battery cap, do not touch or rub your eyes.

Eye Contact: Flush eyes with large amounts of water for at least 15 minutes. Seek immediate medical attention if eyes have been exposed directly to acid.

Skin Contact: Flush affected area(s) with large amounts of water using deluge emergency shower, if available, shower for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.

CD00177-9-14-95

TX00650-3-7-11

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 battery before attempting any maintenance or adjustment.

WR00025-11-30-92

TX04468-10-24-12

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.

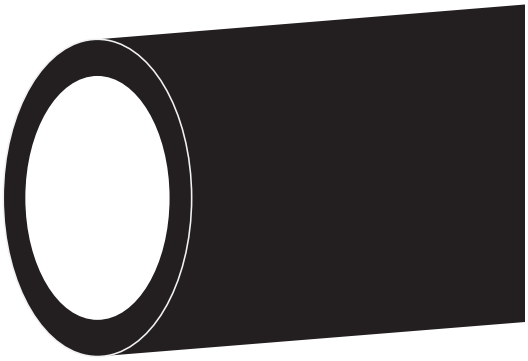
⚠WARNING Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes which eject fluid under pressure. Use a piece of cardboard or paper to search for leaks. If any fluid is injected into the skin, it must be immediately removed by a doctor familiar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

Pipe Handling Safety



⚠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.

Keep persons that are not involved in handling pipe away from handling operations. 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.

TX04586-4-17-13

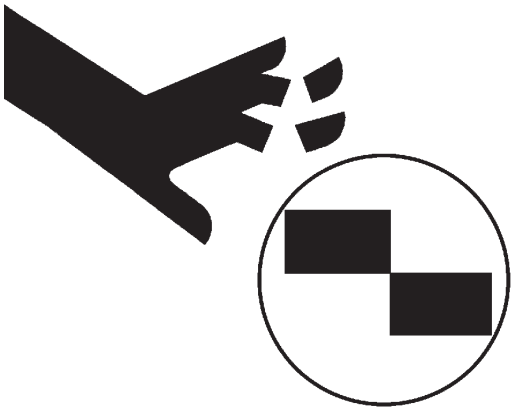
Facer Blades Are Sharp

⚠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

Keep Machine Away From Edge of Ditch

⚠WARNING Heavy equipment too close to a ditch can cause the walls of the ditch to cave-in. Keep the machine far enough away from the edge of the ditch to prevent injury to personnel and damage to the equipment from a cave-in.

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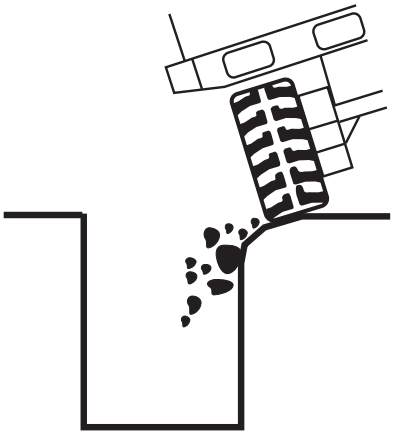

CD00408-12-31-97

Operating Fusion Machine

Place fusion machine on as level ground as possible.

If it is necessary to operate machine on unlevel grade, chock the tracks and block the unit to make it as stable as possible. Some unstable conditions may be ice, snow, mud and loose gravel.

⚠WARNING Operating machine on a grade steeper than 30% could cause the machine to tip over. Never operate the machine on a grade steeper than 30 % (A 3 foot elevation change in 10 feet). Always operate fusion machine from the highest level, on an unlevel grade. Failure to do so could result in serious injury or death.

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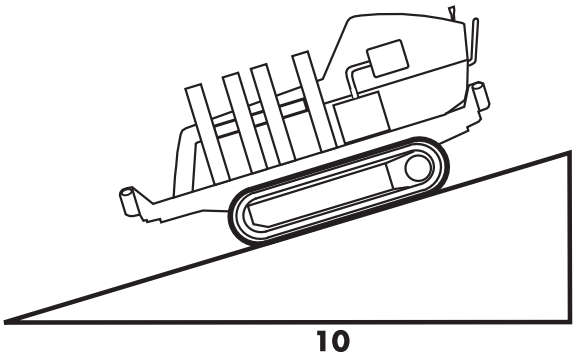


CD00402B-12-30-97

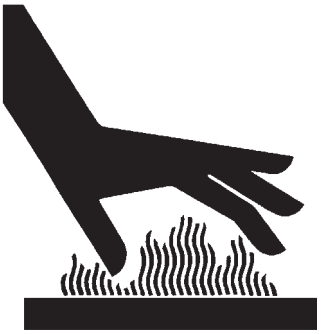
Fusion Equipment Safety

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

Do Not Attempt to Tow Fusion Machine

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

TX01888-3-30-11

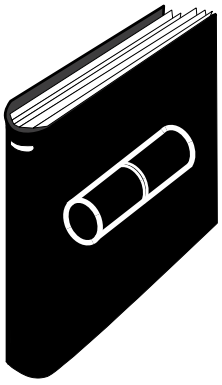
CD00401-12-30-97

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.

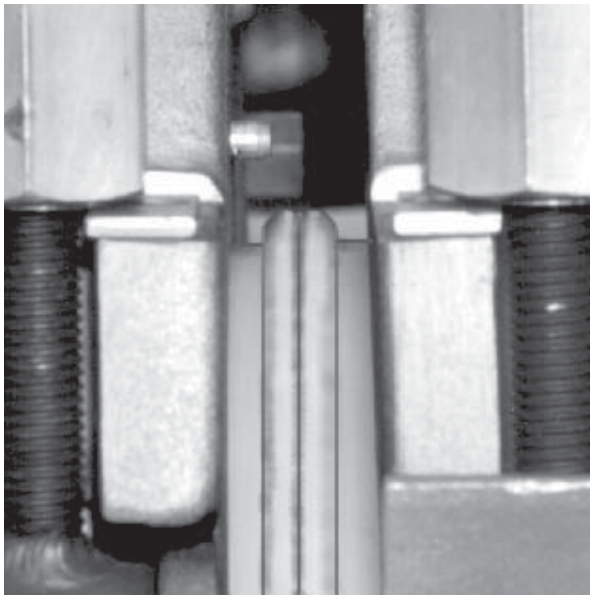
TX04469-10-24-12



WR00079-2-7-96

Overview

Theory of Heat Fusion



PH00363B-1-4-96

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

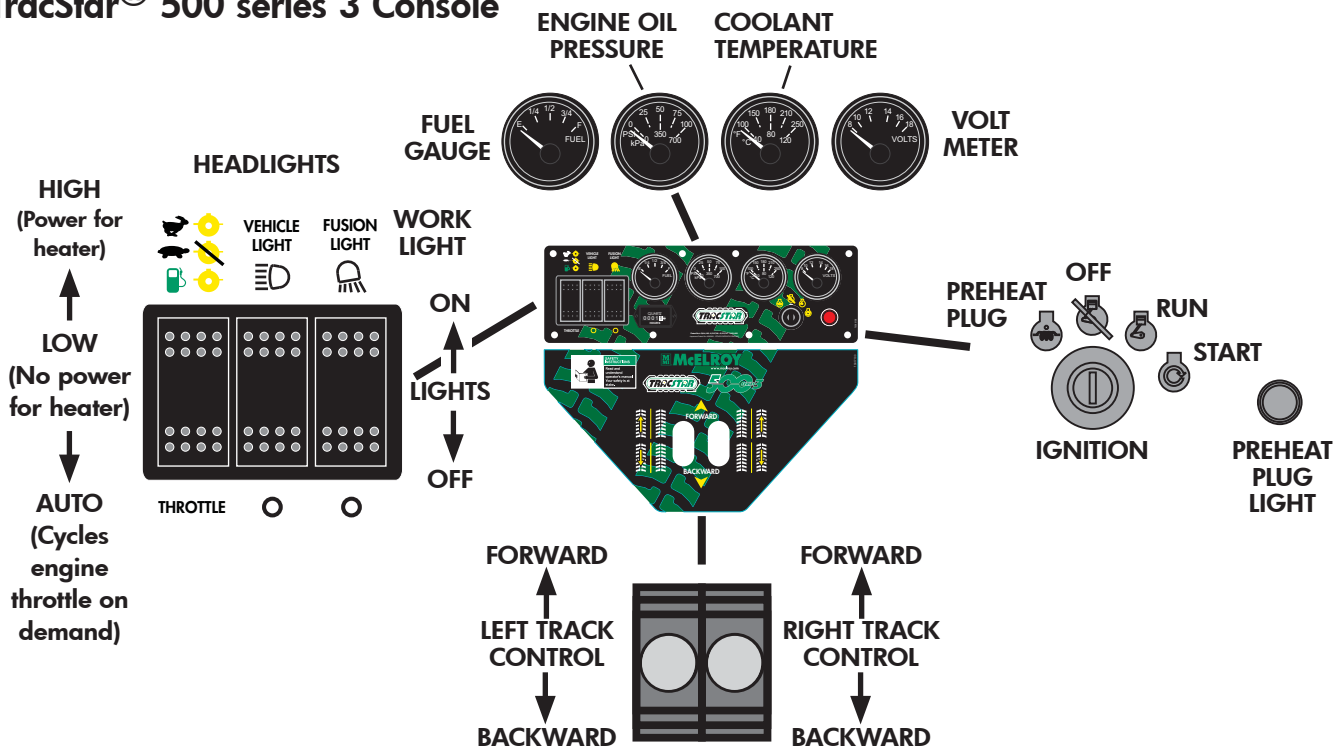
Holding The molten joint must be held immobile with a specified force until adequately cooled.

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

TX02476-04-28-14

Overview

TracStar® 500 series 3 Console



CD00407e-10-8-12

Auto Throttle

Pressing the throttle switch on the dashboard to the bottom position turns on the auto throttle setting.

The auto throttle setting is used to vary the speed of the engine depending on the load needs of the machine. The machine will use high speed while facing, moving the carriage, or when the heater controller cycles on.

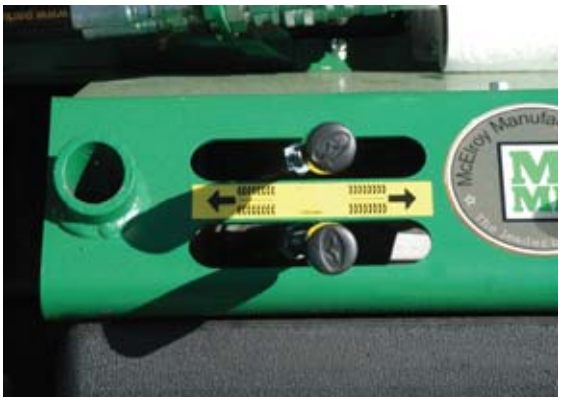
Auto throttle will reduce the amount of noise and fuel usage.

PH04789-10-8-12

TX04470-10-24-12

Alternate Drive Controls

Alternate track drive controls are located on the operator side of the machine. Each lever controls one track. Both levers must be moved together to go forward or backward in a straight line. Moving levers in opposite directions makes the machine turn sharply.



PH04729-10-1-12

TX02002-4-24-02

Pipe Lift Controls

The pipe lift controls are located on the operator side of the machine to the right of the alternate drive controls. Moving the right lever up and down moves the rear pipe lift up and down. Moving the left lever up and down moves the forward pipe lift up and down.

TX02003-4-24-02

PH04730-10-1-12

Carriage Assembly

The carriage assembly consists of two fixed jaws and two hydraulically operated movable jaws. The carriage assembly can be used in a 4 jaw and 3 jaw configurations. The 4 jaw configuration includes the use of the indexer for the heater and facer. The 4th jaw can be removed on the 4 jaw configuration for fusions of ells and tees.

The 3 jaw configuration is removed from the 4 jaw skid and does not use the indexer for the heater and facer. The 3 jaw is a compact fusion configuration for use in close quarters where space is limited.

The carriage assembly can be removed from the machine for remote operation. An optional hydraulic extension and electric cable extension kit is required when using the carriage remotely.

TX04472-10-24-12

PH04739-10-24-12

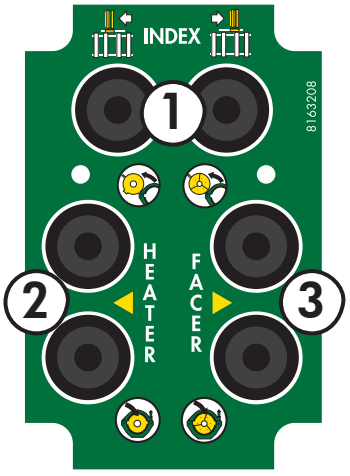
Indexer Controls

The indexer controls are located on the movable jaws of the carriage at the operator position.

1 Controls the movement of the indexer to the left and right.

2 Controls the movement of the heater, moving the heater in and out of the carriage.

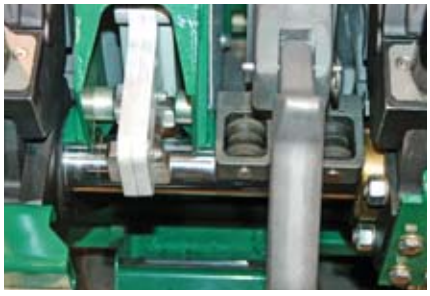
3 Controls the movement of the facer, moving the facer in and out of the carriage.



CD01037-10-1-12

During transport, the heater, heater shroud, and facer can be rotated into the carriage and the carriage closed on all three capturing them between the jaws keeping them secure during the moving of the machine or transporting the machine.

TX04474-10-24-12



PH04814-10-24-12

Inlet Fans

Inlet fans are used to draw cooler air from the outside of the machine to the generator compartment.

NOTICE: Never obstruct the fans. Allow enough area for air to circulate into the machine. Restricting air to the fans could cause components to overheat and fail.

TX04990-04-27-16

PH05507-04-27-16

Facer

The facer is a McElroy rotating planer-block design. The blade holders each contain three cutter blades. The block rotates on ball bearings and is chain driven (enclosed in lubricant) by a hydraulic motor. The facer is removable for in-ditch operation and features a lifting point for lifting the facer in and out of the ditch.

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

TX04473-10-24-12

PH04741-10-8-12

Hydraulic Manifold Block

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

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 gauge is mounted on top of the manifold.

C) The selector valve, mounted on the front 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 400 psi.

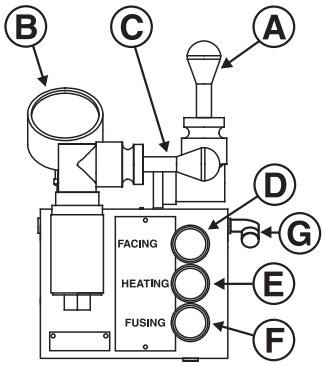
E) The middle valve adjusts heating pressure to a maximum of 400 psi.

F) The bottom valve adjusts fusion pressure to a maximum of 2300 psi, which is the set system pressure.

G) DataLogger port

TX04541-10-24-12

PH04731-10-1-12



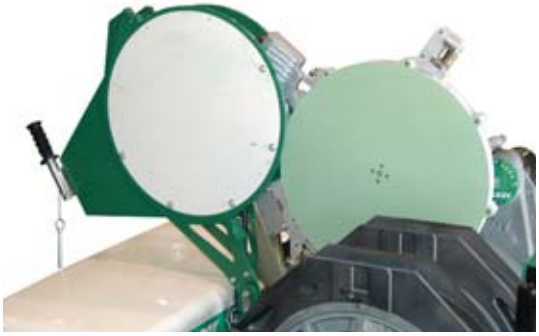
CD00138H-1-12-11

Heater

The heater is equipped with butt fusion heater plates, coated with an antistick coating.

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

The heater cord plugs into a military type receptacle on the heater arm and electrical box. Tighten coupling nut after plugging into the receptacle.



PH04796-10-15-12

Before the heater is used, the heater must be rotated all the way out of the carriage and the heater shroud pin removed. This will allow the heater to separate from the heater shroud.

When the machine is ready to be stored or transported, rotate the heater out of the carriage and hold the heater shroud handle and insert the pin to capture the heater in the heater shroud. The heater and heater shroud are now connected and can be rotated into the carriage together.

PH04732-10-1-12

When needed, the heater can be removed from its indexer mounted pivot arm, for in-ditch operation. The heater has a lifting point on the top of the heater and a stripper bar is available for in-ditch operation.

The optional extension kit as well as the optional heater stand is needed for in-ditch heater operation.

PH04813-10-24-12

GFCI Operation and Testing

1. Press **RESET** button. The GREEN "power" LED should be ON.
2. Press **TEST** button: GREEN LED should turn OFF, RED LED should start BLINKING. Circuit breaker should trip to OFF position.
3. If sensing module LEDs do not trip. DO NOT USE THIS DEVICE. Consult a qualified electrician for assistance.
4. Press **RESET** button: RED LED should turn OFF and GREEN LED should turn ON.
5. MANUALLY RESET circuit breaker to ON position to restore circuit power.

PH04810-10-24-12

⚠ WARNING Do not use this device if it fails any portion of the above test. If the device fails, a possible shock hazard could occur leading to serious injury or death. Consult a qualified electrician for repair or replacement.

Test the GFCI module regularly in accordance with local rules and regulations

TX04475-05-05-14

Diesel Engine

Read the operating and maintenance instructions for the engine before operating.

There is a key ignition on the console that shows the preheat, start, run and off positions.

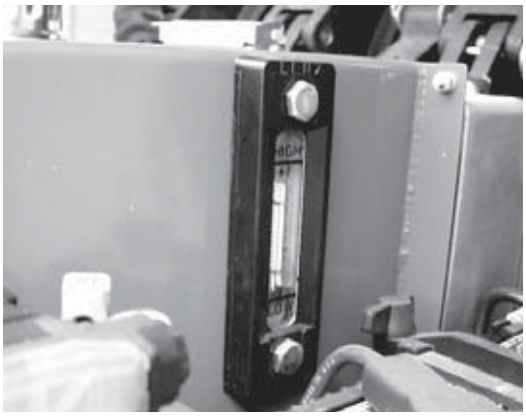
TX01465-2-10-98

PH04790-10-24-12

Hydraulic Fluid Reservoir

The hydraulic fluid reservoir is located under the front hood of the machine. The fluid level sight gauge is located on the front of the reservoir. Proper fluid level is indicated on the sight gauge.

TX01467-05-05-14



PH01251-1-29-98

Filter

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

TX01496-3-3-98

PH02000-1-15-01

Hydraulic Clamping

Hydraulic clamping cylinders apply force to the jaws to clamp the pipe. Both inner cylinders have knobs that can adjust the stroke of the cylinder for Hi/Lo adjustment.

TX04476-10-24-12

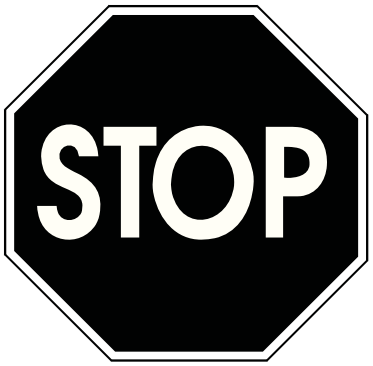
PH04027-3-2-10

Operation

Read Before Operating

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

Return manual to the protective storage box when not in use. This manual is to be considered part of your machine.



Stop-12-28-95

TX00401-9-15-94

Check Hydraulic Fluid Level

Check fluid level in sight gauge on reservoir and add fluid if necessary.

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

PH01251-22-98

TX01450-05-05-14

Diesel Engine

Read the operating and maintenance instructions for the engine before operating.

The key ignition has four positions. Preheat, off, run and start.

NOTICE: Switch the engine to slow speed before starting.

For cold weather starting, turn switch to preheat for no longer than 10 seconds. Never use starting fluid.

Turn the key and start the engine.

Confirm that all gauges read correctly.

Turn the key to OFF to stop the engine.

PH04790-10-8-12

TX02377-1-10-05

Moving Machine Into Position

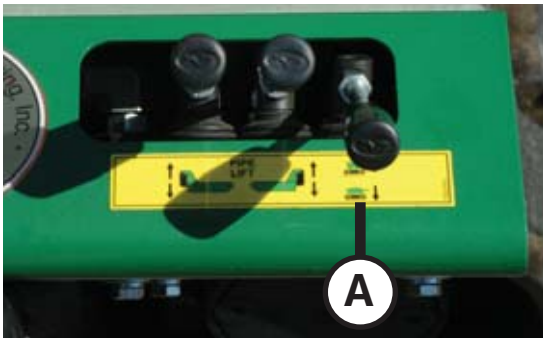
Make sure all personnel are safely clear of the machine before moving.

Move both track control levers forward to go in a straight line. Release the levers to stop. Moving just the right track forward turns the machine to the left. Moving just the left track forward turns the machine to the right. There are alternate track controls on the left side of the machine.

The track speed valve (A) is used to switch between low speed/high torque and high speed/low torque. The machine will not have torque available to turn in all conditions in high speed.

PH02290-4-17-02

PH04729-10-1-12



PH04730-10-1-12

TX04477-10-24-12

Prepare Heater

Install butt fusion heater plates.

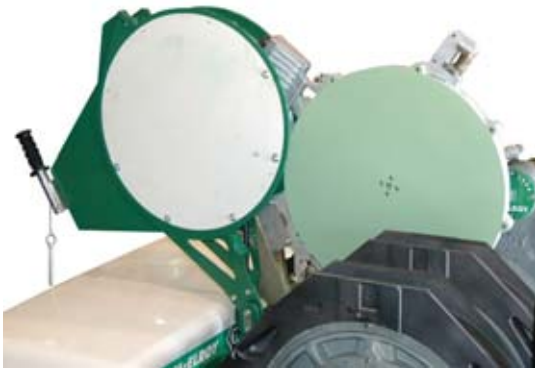
NOTICE: Non-coated heaters should never be used without butt fusion heater plates installed. Refer to the "Maintenance" section of this manual for installation procedure.

⚠ 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.

Ensure the heater cables are connected and switch the throttle to High  or Auto. 

Refer to the section "Adjusting Heater Temperature" in the Maintenance section of this manual for instructions on setting the heater temperature.



PH04796-10-1-12

PH04789-10-8-12

TX04531-05-05-14

Install Clamping Inserts

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

TX00368-9-15-94

PH02283-4-2-02

Set up Pipe Supports

Set up pipe stands and adjust height so the pipe is in line with the jaws.

X00367-9-15-94

PH01264-2-12-98

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 pipe ends protrude more than 1″ past the face of the jaws.

TX01094-8-20-96

PH04734-10-1-12

Positioning Pipe into Machine

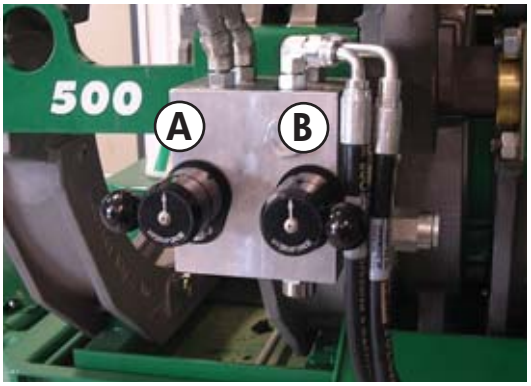
Swing the facer into place. Move the carriage toward the fixed jaw, while watching the gap at each end of the facer guide rod brackets. When the pipe is in contact with the facer, this gap indicates the amount of material that will be trimmed from the pipe end. Assure sufficient material will be removed for a complete face off.

PH04735-10-24-12

TX04479-10-24-12

Hydraulic Clamping

The controls are located on the end of the inner fixed jaw. The left knob **(A)** opens/closes the fixed jaws and the right knob **(B)** opens/closes the movable jaws.



PH04058-3-2-10

To unclamp the jaws:

With your free hand, hold the tie bar between two cylinders.

Rotate the valve knob up to unclamp.

Pull the tie bar towards operator until the cylinders come to rest.

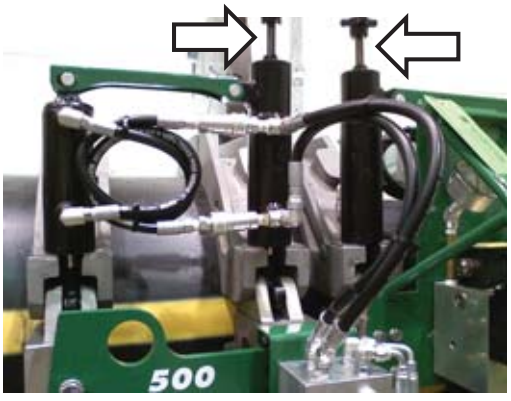
To clamp the jaws:

Push the cylinder tie bar toward the jaws until cylinders are vertical.

Rotate the valve knob down to clamp.

Hi/Lo adjustment:

Unclamp the jaw slightly and return the clamping control to the neutral position. Make adjustments to the Hi/Lo by turning the knob on top of the cylinder and then reclamp the jaw.



PH04059-3-2-10

⚠CAUTION Prior to starting the machine, always ensure that the hydraulic clamping directional valves are both in the center (neutral) position to eliminate undesired clamp cylinder movement during startup.

TX04480-10-24-12

Begin Facing

Turn facer on by opening valve on top of the facer.

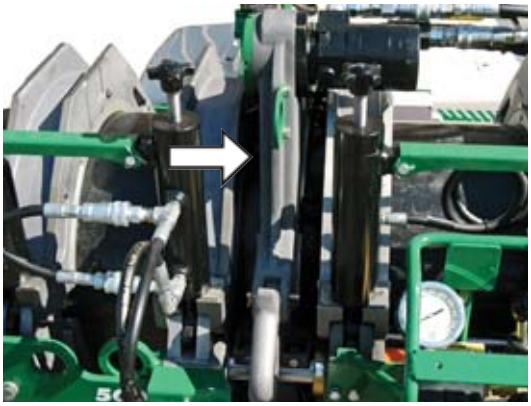
Move the selector valve on the hydraulic manifold block to the top (facing pressure) position.

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.

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.

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.

TX04261-3-30-11

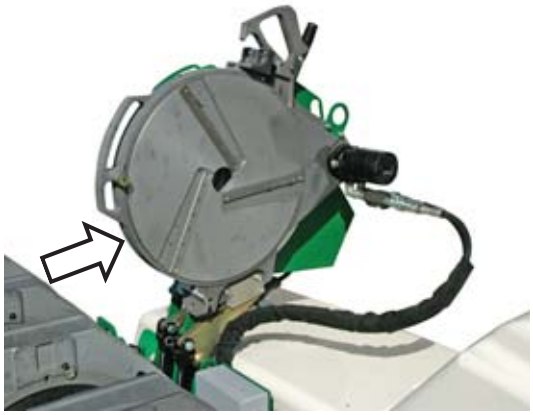


PH04735-10-2-12

PH04736-10-2-12

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. Do not touch faced pipe ends.



PH04741-10-24-12

TX04262-3-30-11

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.

⚠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.

Ensure there is no unacceptable gap between the pipe ends. If there is an unacceptable gap, return to **Loading Pipe into Machine**.

If pipe is not lined up, make a HI/LO adjustment to the jaw of the high side.

Hi/Lo adjustment:

Unclamp the jaw slightly and return the clamping control to the neutral position. Make adjustments to the Hi/Lo by turning the knob on top of the cylinder and then reclamp the jaw.

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

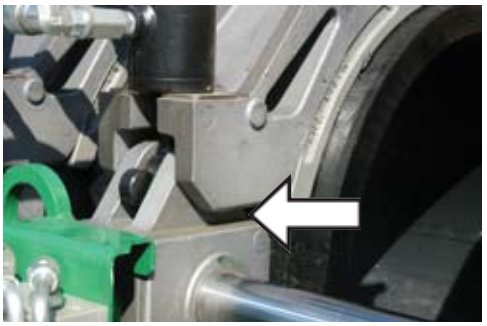
Repeat adjustment until pipe is aligned.

NOTICE: When clamping, do not over-adjust the clamping force 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.

Over-adjustment may cause thin-walled pipe to compress affecting the ovality of the pipe

TX04482-10-24-12

PH04737-10-2-12



PH04742-10-8-12

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.

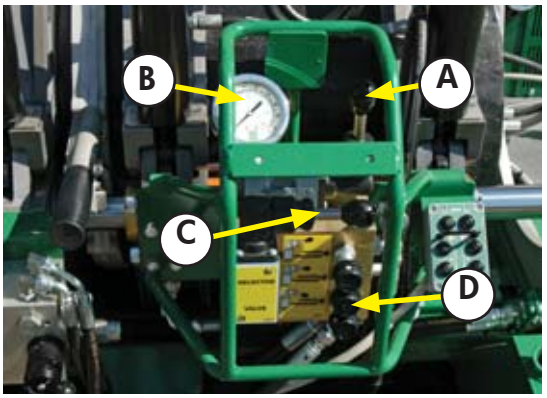
Shift the carriage control valve to the left.

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



PH01924-11-15-00

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

PH04004-8-25-09

TX03024-10-19-10

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, return to **Loading Pipe into Machine**.

PH04737-10-8-12

TX00971-12-7-10

Position Carriage for Heater Insertion

Move the carriage to open a gap large enough to insert the heater.

PH04785-10-8-12

TX01462-2-9-98

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 or appropriate joining standard for proper heater temperature.

TX04536-10-24-12

WR00077-4-16-93

Inserting Heater

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

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

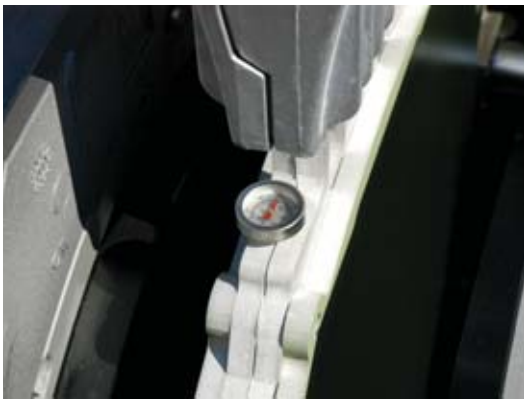
Use a clean non-synthetic cloth to clean the butt fusion heater plate surfaces.

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

Insert heater between the pipe ends.

TX04537-05-05-14

PH04738-10-2-12



PH04803-10-24-12

Heat Pipe

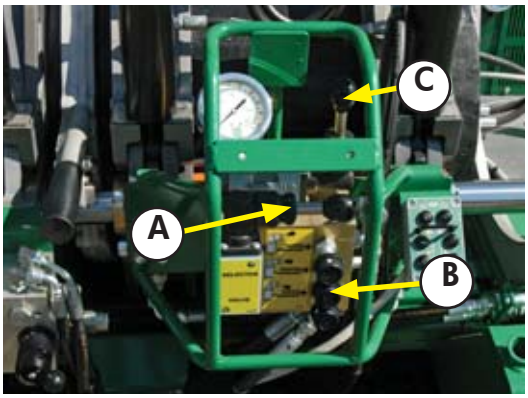
Shift the selector valve (A) to the center position, and set the heating pressure (if required). If heating pressure is not required, set the pressure reducing valve (B) at its lowest setting, or the drag pressure, whichever is higher.

Shift the selector valve (A) to the fusion position and move the carriage control valve (C) to the left to bring pipe ends in contact with the heater. Move selector valve (A) 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.

TX04264-3-30-11



PH04731-10-24-12

PH04804-10-24-12

Fusing the Pipe

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

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

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

Quickly remove the heater.

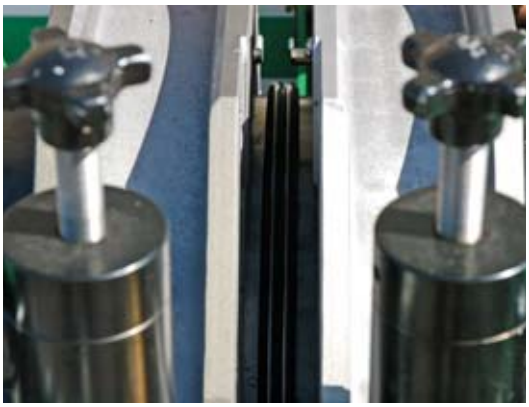
Quickly inspect pipe ends for appropriate melt.

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.

TX04265-3-30-11



PH04805-10-24-12

Opening Movable Jaws

After the joint has cooled for the pipe manufacturer's recommended time, shift the carriage control to the neutral position.

Unclamp the clamp cylinders, and open carriage far enough to open the jaw nearest the facer.

Open the movable jaws.

TX04486-10-24-12

PH04806-10-24-10-2

Opening Fixed Jaws

Open the fixed jaws.

TX00381-9-16-94

PH04807-10-24-12

Raise Pipe

Raise the joined pipe using the hydraulic pipe lift.

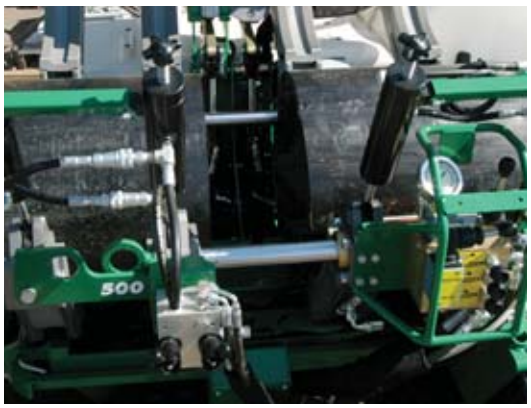
TX00818-12-21-95

PH02301-4-17-02

Position Pipe for Next Joint

Move the fusion machine to end of pipe, or pull the pipe through the jaws until the end of the pipe is protruding more than 1" past the jaw face of the fixed jaw.

TX01091-8-20-96



PH04808-10-24-12

Install Next Piece of Pipe

Insert a new piece of pipe in movable jaws and repeat all previous procedures.

PH04809-10-24-12

TX00384-10-12-95

Special Operations - In Ditch

Overview

The carriage may be removed and hoisted into a ditch. The 4 jaw carriage can be used with heater and facer attached to the indexer or if needed, a more compact 3 jaw carriage. Using the 3 jaw carriage requires lifting equipment to hoist the heater and facer from overhead and will require an optional 3 jaw in-ditch kit containing heater and facer stands, stripper bars for heater, and guide rod bracket for facer. An optional hose and cable extension kit is required for both 3 jaw and 4 jaw in-ditch operation.

NOTICE: Turn ignition key to off position before doing anything else.

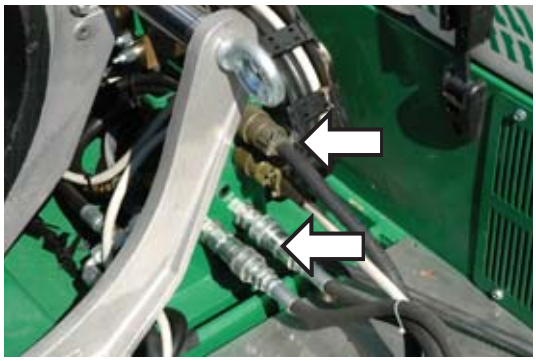
PH04790-10-24-12

TX04487-10-24-12

Remove Hydraulic Hoses and Cables

Disconnect the hydraulic hoses, electrical cables, and heater power cable from the carriage.

NOTICE: All connections must be disconnected or damage will result when removing the carriage.



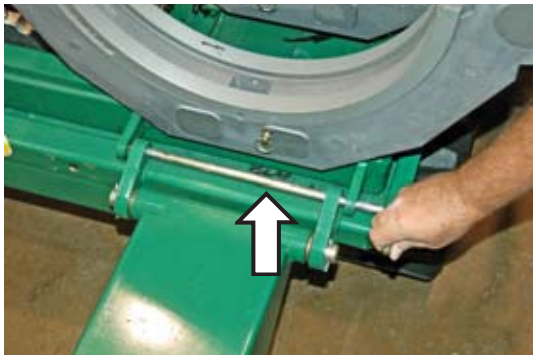
PH04766-10-8-12

PH04810-10-8-12

TX04488-10-24-12

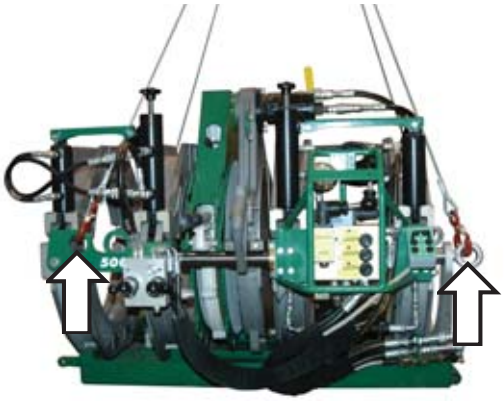
Remove 4 Jaw Carriage

Remove the carriage pin at the front of the machine.
Slide the carriage as far forward as possible.



PH04762 10-8-12

Attach lifting device to the four lifting points on the carriage.
Lift the carriage from the vehicle.



PH01476710-24-12

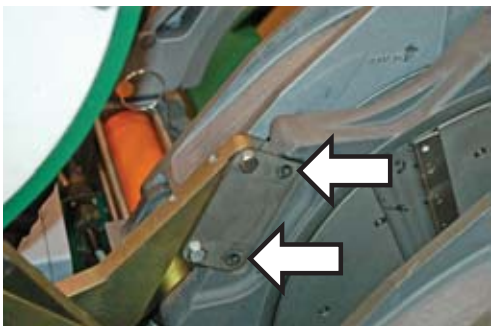
The outer fixed jaw of the carriage can be removed if needed on the 4 jaw skid. This will allow fusing tees or ells with heater and facer attached to the indexer.

TX04489-10-24-12

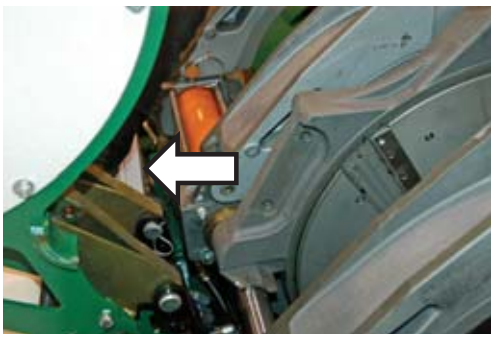
Removing Heater and Facer

To Remove the Facer:

Remove the two bolts that attach the facer splice plate to the facer.


PH04763-10-8-12

Rotate the facer pivot arm away from the facer.


PH04752-10-8-12

Disconnect the facer hydraulic hoses.

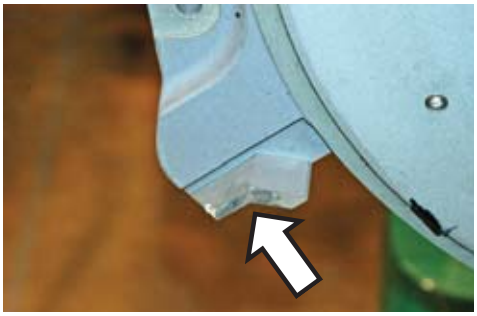

PH04776-10-19-12

Attach a lifting sling to the lift point on the facer and lift the facer from the carriage.


PH04777-10-8-12

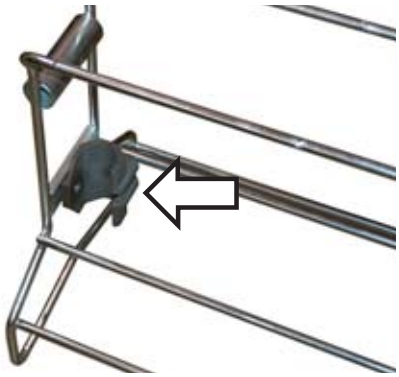
In order to use the facer in an in-ditch operation, the bracket that rests on the carriage guide rods must be exchanged with an in-ditch facer bracket that in stored on the facer stand.

Remove the two bolts that hold the bracket in place.


PH04757-10-8-12

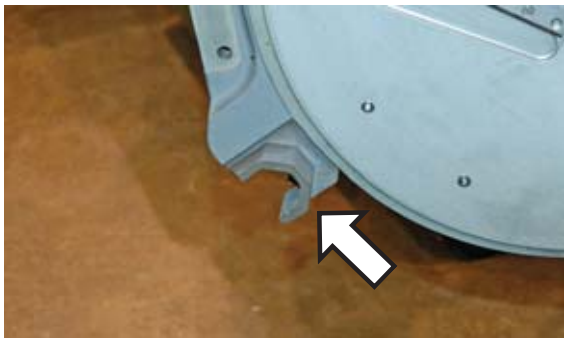
Removing Heater and Facer (continued)

Remove the bracket for in-ditch operations from the facer stand.



PH04759-10-8-12

Attach the in-ditch facer bracket to the facer with the two bolts.



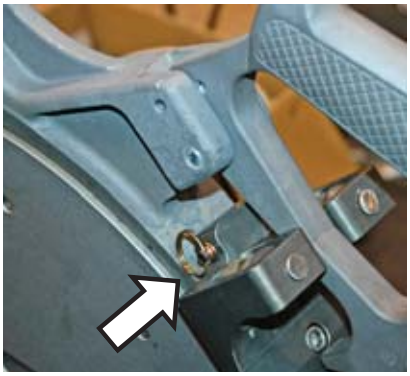
PH04760-10-8-12

The bracket that is not being used can be stored on the optional facer stand until it is needed. Place the facer in the facer stand.

PH04761-10-8-12

Remove detent pin from facer latch handle and store in open hole near the roller housing.

PH04811-10-8-12



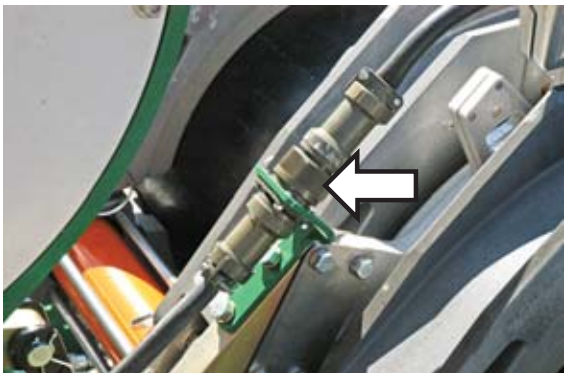
PH04812-10-8-12

Removing Heater and Facer (continued)

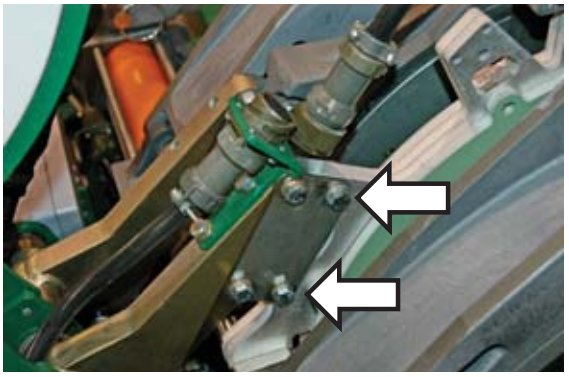
To Remove the Heater for In-Ditch Operation:

⚠CAUTION Heater may be hot and could cause injuries from burns. Allow heater to cool before attempting to remove heater.

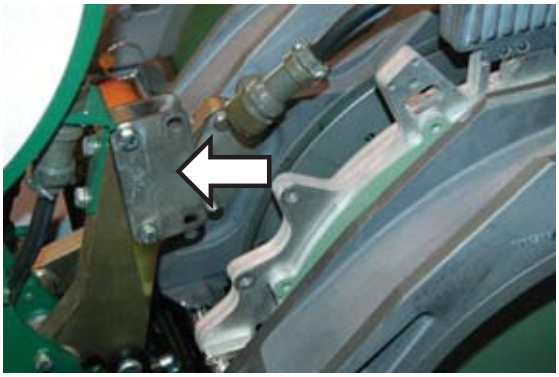
Disconnect the heater power cable on the top of the heater.


PH04763-10-8-12

Remove the two bolts that attach the heater splice plates to the heater.


PH04752-10-8-12

Rotate the heater pivot arm away from the heater.


PH04752-10-8-12

Attach a lifting sling to the lift point on the top of the heater.

Lift the heater away from the carriage and place it into the heater stand.


PH04764-10-8-12


PH04757-10-8-12

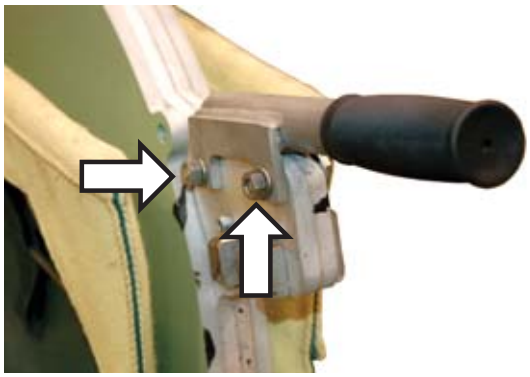
Removing Heater and Facer (continued)

Install the heater handle and stripper bar for in-ditch operation:

Remove the two bolts of the handle from heater shroud. Remove the handle.

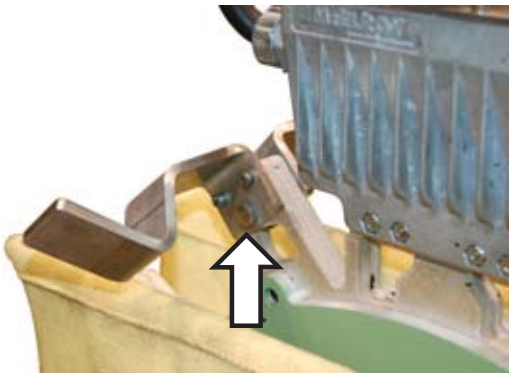
PH04797-10-8-12

Install the handle on the end of the heater using fasteners supplied with the 3-Jaw in-ditch kit.



PH04798-10-8-12

Attach the heater stripper bar from the 3-Jaw in-ditch kit to the heater using the three supplied bolts.



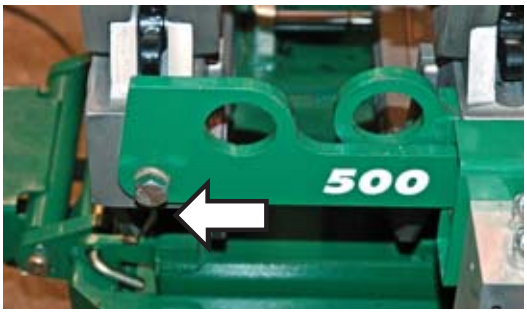
PH04799-10-8-12

TX04490-10-24-12

Removing 3 Jaw Skid

If the carriage is going to be used for fusing to a tee or for close quarters fusion, you can use the 3 Jaw carriage.

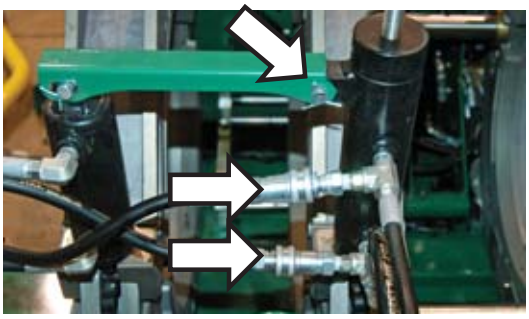
Remove the outer fixed jaw braces.



PH04743-10-8-12

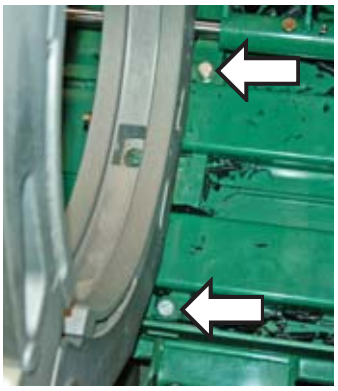
Remove the pin that connects the cylinder tie bar on the inner clamp cylinder. Rotate the tie bar away from the inner clamp cylinder.

Disconnect the two hydraulic hoses that connect the inner clamp cylinder to the outer clamp cylinder.

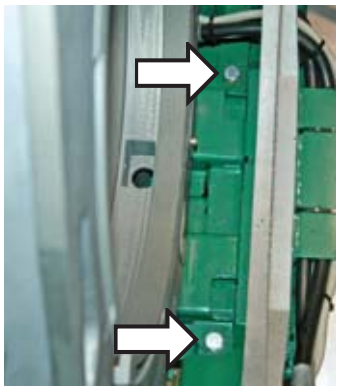


PH04744-10-8-12

Remove the four bolts that attach the 3-Jaw skid to the 4 jaw skid.



PH04746-10-8-12



PH04747-10-8-12

Disconnect the hydraulic hoses and electrical cables on the underside of the carriage.

PH04745-10-19-12

The 3-Jaw skid can now be lifted out of the 4-Jaw skid leaving the outer fixed jaw behind.

TX04542-10-24-12

Special Operations - In Ditch

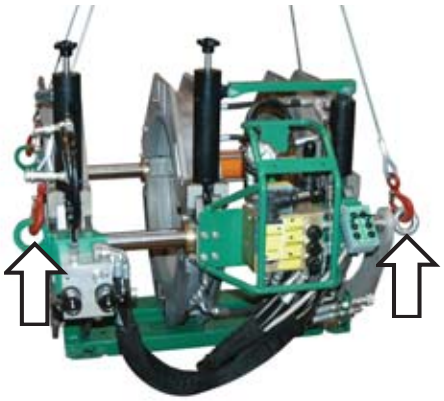
Lift 3-Jaw Carriage from Machine

Connect the hydraulic hoses to each other to keep dirt out of the connectors.

The three jaw unit should be used only when space is not available for the entire carriage, such as fusing onto a tee or an ell.

Attach lifting sling to the lifting eyes on the carriage. Lift carriage assembly and lower into ditch.

TX04492-10-24-12



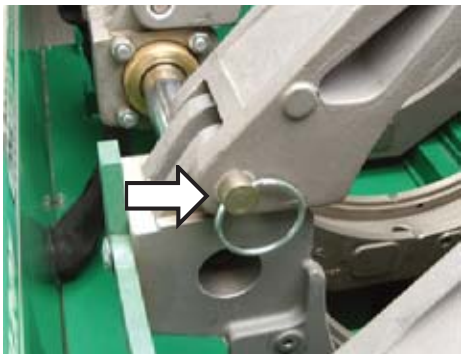
PH04748-10-8-12

Removing Top Jaws

If the carriage needs to be hoisted and slid underneath the pipe, the top jaws need to be removed.

Unclamp all jaws. Take out the detent pins securing the top jaws and remove the jaws.

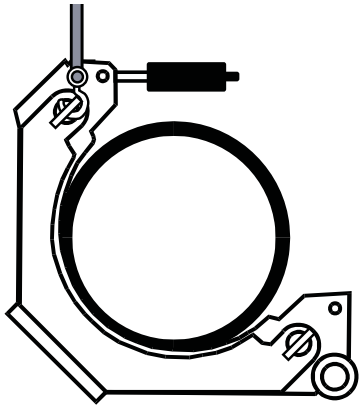
TX04493-10-24-12



PH02284-4-17-02

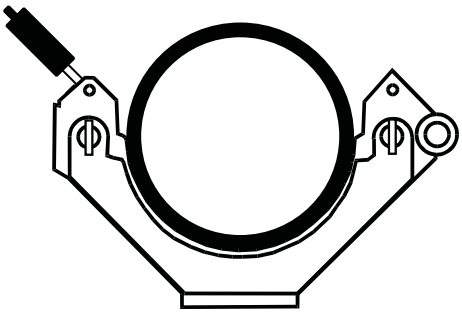
Position Carriage Under Pipe

Position carriage assembly on side of the pipe. Lift pipe and slide carriage assembly under pipe.



CD01038-10-8-12

Rotate carriage assembly around to a normal upright position.

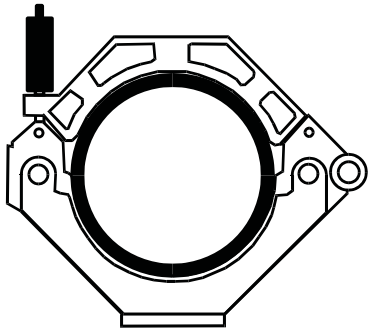


CD01039-10-8-12

TX01476-2-26-98

Attach Upper Jaws

Attach the top jaws and clamp around pipe.



CD01040-10-8-12

TX01484-2-26-98

Attach Hydraulic Hoses and Cables

PH01299-3-4-98

For the 4 Jaw carriage, there are 2 sets of hydraulic hoses for connections to the carriage and facer.

Connect the extension hoses for the carriage, facer, indexer, and hydraulic clamping. The extension hoses are connected between the hydraulic connection on the machine and the hydraulic connection on the component.

There are also 3 electrical cables for the heater, indexer, and indexer switch box.

Connect the extension cables for the heater, indexer, and the indexer switch box. The extension cables are connected between the electrical connection on the machine and the electrical connection on the component.

For the 3 Jaw carriage, there are 2 sets of hydraulic hoses for connections to the carriage and facer.

Connect the extension hoses for the carriage, facer, and hydraulic clamping. The extension hoses are connected between the hydraulic connection on the machine and the hydraulic connection on the component.

There is also 1 electrical cable for the heater.

Connect the extension cable for the heater. The extension cable is connected between the electrical connection on the machine and the electrical connection on the component.

Connect all hoses and cables appropriate for the configuration of carriage being used.

TX04539-10-24-12

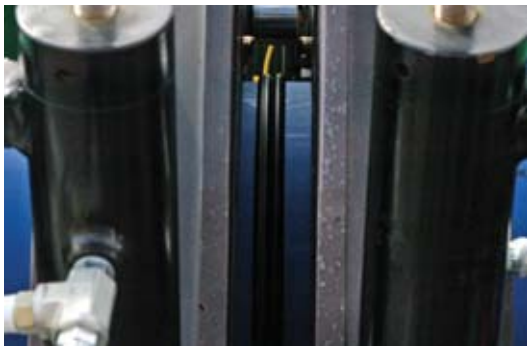
Special Operations - In Ditch

Make Fusion Joint

Refer to the "Butt Fusion Procedure" for operating instructions.

After facing operation, remove the facer from ditch.

TX00450-9-16-94

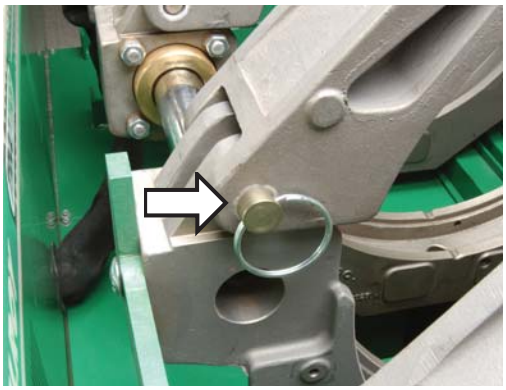


PH04787-10-8-12

Remove Upper Jaws

Unclamp jaws, pull ball lock pins and remove the top jaws.

TX04495-10-24-12



PH02284-4-17-02

Remove Hydraulic Hoses and Cables

Disconnect hydraulic hoses and electrical cables to the carriage and remove hoses from ditch.

TX04496-10-24-12

PH01299-3-4-98

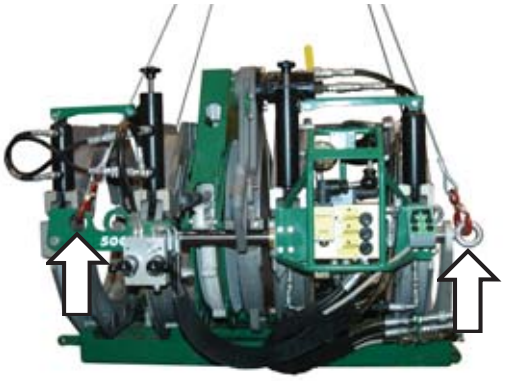
Special Operations - In Ditch

Remove Carriage From Ditch

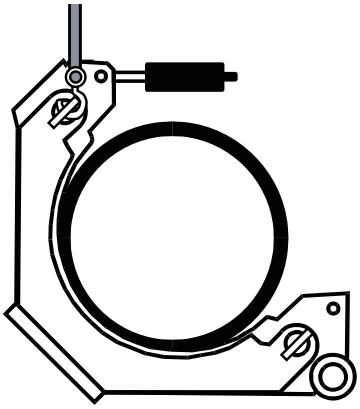
Attach sling to lifting points.

Rotate carriage assembly from under pipe.

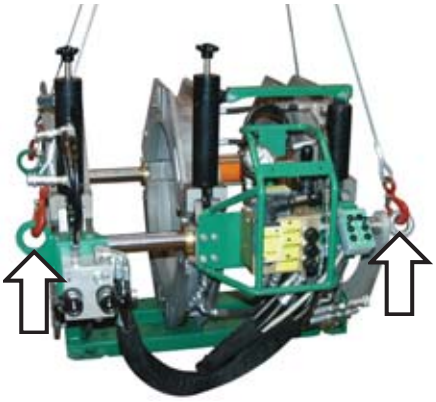
Lift carriage assembly from ditch.



PH01476-10-24-12



CD01038-10-8-12



PH04748-10-24-12

TX04497-10-24-12

Special Operations - Lifting the Machine

Lifting Safety

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

SAFE1st 12-14-92

⚠WARNING

Safety warnings:

1. Do not exceed rated load or lift loads greater than the rated load rating of the lifting device.
2. Do not operate a damaged or malfunctioning device.
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 lifting device.
11. Employ generally accepted safe lifting practices.
12. Do not shock or impact load the lifting device.
13. Inspect all lifting pins for damage.

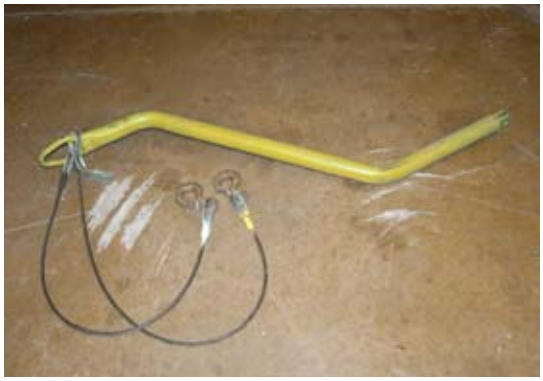
VR00014-3-8-93

TX04268-02-27-14

Required Equipment

- ❑ Proper overhead rigging and equipment of adequate load rating to lift the fusion machine.
- ❑ Lifting Sling - (supplied with machine) Only use the lifting sling that is supplied with the machine to lift the machine.

NOTICE: Check all equipment to confirm that it is in good working order.



PH04800-10-23-12

TX04532-10-24-12

Attach Slings

Ensure the lifting points are in good repair before lifting the machine.

Attach the sling to the lift points on the machine. The steel tube goes to the outside of the machine as shown at **A**, the shorter cable with white sleeve goes to the rear of the machine as shown at **B**, and the longer cable with the yellow sleeve goes to the front of the machine as shown at **C**.

PH04791-10-24-12

PH04792-10-24-12

TX04498-10-24-12

Maintenance

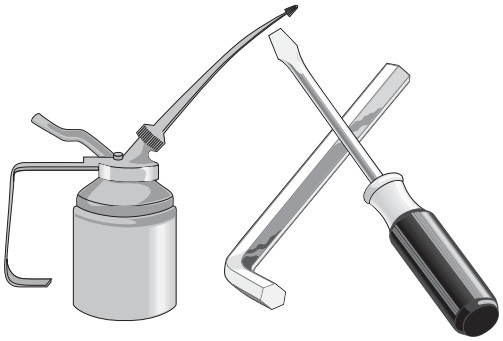
Preventative Maintenance

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 preventative maintenance be kept.

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

TX00428-8-10-95



CD0014211-2-94

Washing the Machine

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

Do not pressure wash.

TX00429-04-28-14

CD00178-5-3-96

Check Hydraulic Fluid

The hydraulic fluid level should be checked daily.

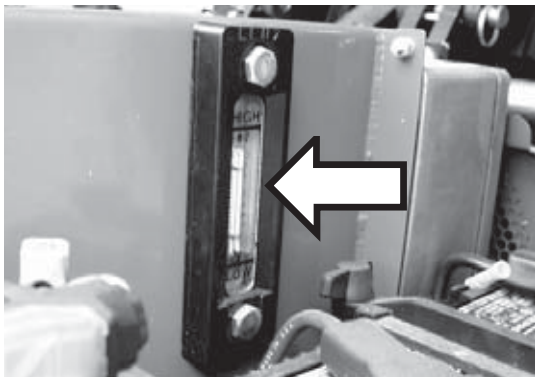
If hydraulic fluid is not visible in the sight gauge, fluid must be added.

If level drops below this point, fill reservoir to the HIGH level on the sight gauge.

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

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

TX01913-05-05-14



PH01251-2-225-98

Change Hydraulic Fluid and Filter

The hydraulic fluid and filter should be replaced after every 400 hours of operation.

Fluid should also be changed as extreme weather conditions dictate.

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

TX04713-05-05-14

PH01250-2-225-98

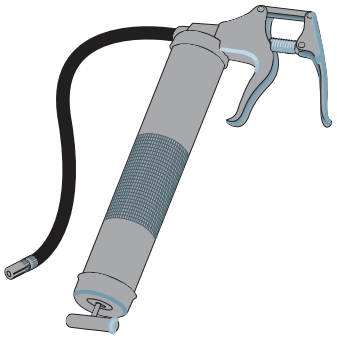
Grease

Keep moving parts well lubricated daily with high temperature grease.

Indexer carriage bearings

Facer pivot bushings

Heater pivot bushings



CD00183-10-22-12

TX04522-10-24-12

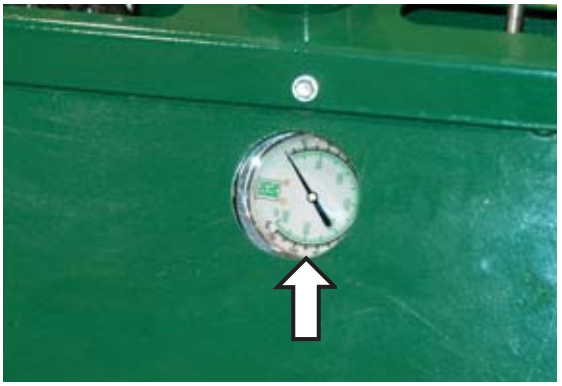
Adjusting System Pressure

Remove the side engine cover to gain access to the hydraulic pump.

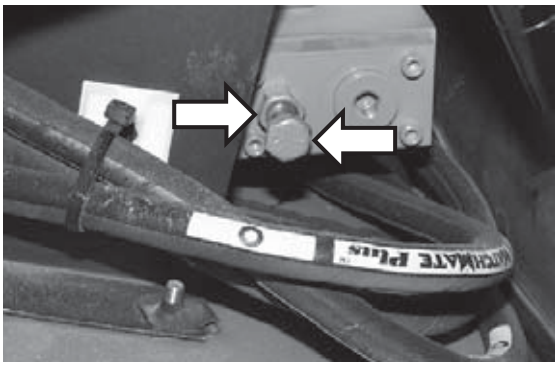
Start the engine and select high speed.

The system pressure should be at 2300 psi.

To adjust the pressure, loosen the jam nut and turn the compensator to the right to increase the pressure, or to the left to decrease pressure.



PH04801-10-22-12



PH01312-3-12-98

TX04523-10-24-12

Bleeding Air From Fuel Line

If the fuel tank becomes empty, air will be pumped into the fuel line. The following procedure will purge the system of air.

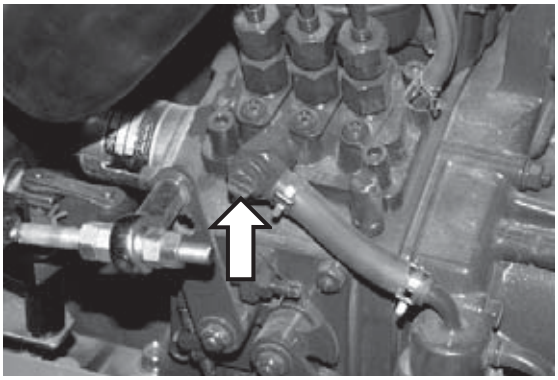
Loosen the air vent plug where the fuel line from the pump goes to the injectors.

Turn the ignition key to START position until fuel starts coming out of the vent plug, then turn key off.

Tighten air vent plug.

The engine can now be started.

TX01505-3-12-98



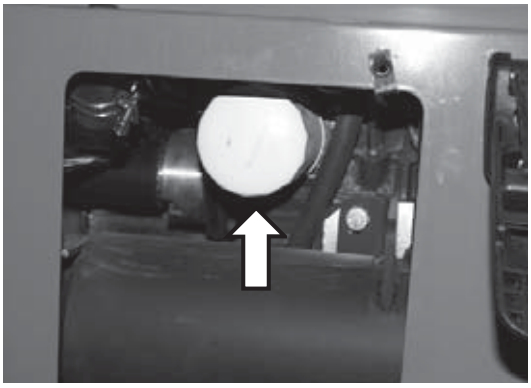
PH01309-3-12-98

Engine Oil System

Read the engine maintenance instructions for scheduled maintenance intervals.

Use appropriate oil for the ambient temperature.

The oil filter is located behind the engine access panel.



PH01311-3-12-98

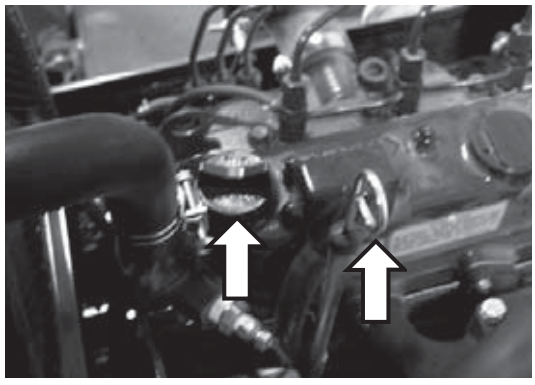
The oil drain plug is located on the bottom of the oil pan and has a drain hose to drain the oil away from the tracks.

PH04768-10-8-12

When the drain hose is not being used, it should be stowed above the cross member away from the exhaust.

PH04802-10-8-12

The oil filler cap and dip stick are located on top of the engine.



PH01313-3-12-98

TX04524-10-24-12

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.

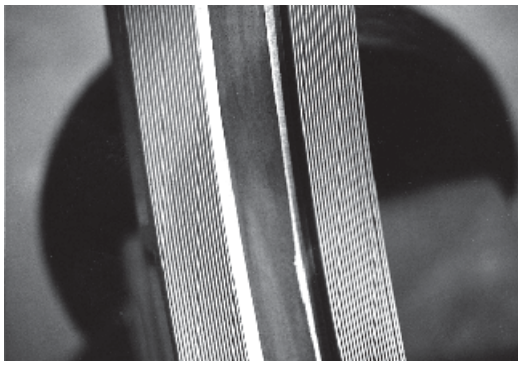
PH04741-10-8-12

TX02475-3-29-05

Clean Jaws and Inserts

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

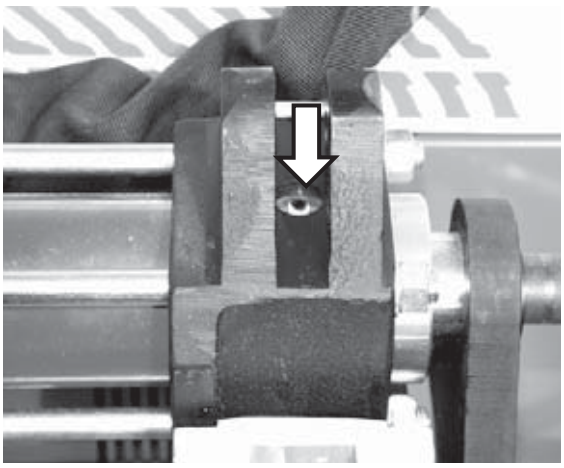
Clean the jaws and inserts of any dirt or residual material using a stiff-bristled brush.



PH00927-8-20-96

TX00433-9-15-94

Bleeding Air From Hydraulic System



PH01296-3-4-98

The two carriage cylinders have air bleed **screws** and must be bled if the system ever runs low on oil or leaks air on inlet side of pump. Air in the system is indicated when carriage movement becomes jerky and erratic. To bleed the system, proceed as follows:

Tilt machine 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 before proceeding.

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

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

Repeat this operation on the opposite cylinder.

Tilt the machine so the opposite end is higher than the fixed jaw end. Move the carriage to the end opposite the fixed jaw and repeat the above procedure on the this end of the cylinders.

TX00877-2-16-96

Installing Butt Fusion Heater Plates

PH04769-10-8-12

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

Install butt fusion heater plates while the heater is cool.

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 bolts.

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

TX04525-10-24-12

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.

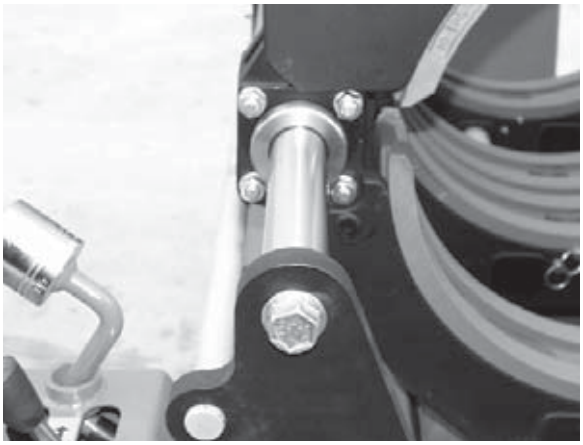
NOTICE: Do not use an abrasive pad or steel wool. Use a non-synthetic cloth that won't damage surfaces.

PH04738-10-24-12

TX04526-10-24-12

Fasteners Must Be Tight

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

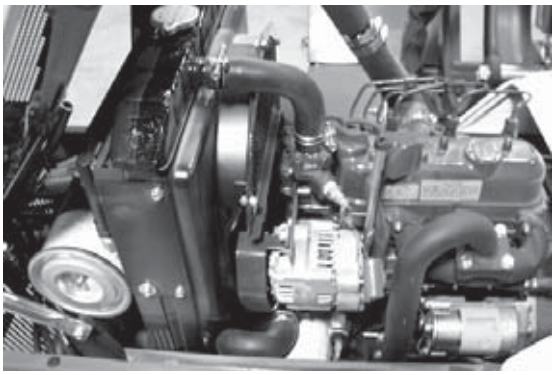


PH01282-225-98

TX00437-9-13-94

Engine Maintenance

Refer to the operation and maintenance manual for the engine.



PH01293-3-3-98

TX01500-3-5-98

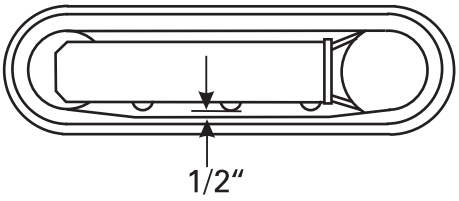
Checking Track Tension

Park the machine on a flat solid surface.

Use the spreader bar or hydraulic jacks for raising machine off the ground.

Place adequate supports under the bottom frame after lifting.

Measure the deflection between the bottom center roller and the inside surface of the rubber track. Track tension is normal when this distance is about 1/2". If the deflection is more or less than this, the tension needs to be adjusted.



CD00463-225-98

TX01472-2-25-98

Adjusting Track Tension

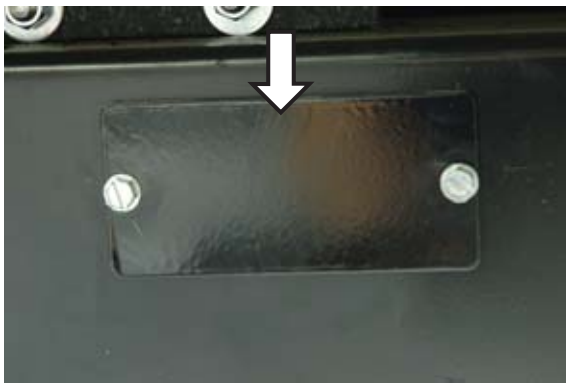
⚠WARNING The grease in the hydraulics of the track is pressurized. If the grease valve is loosened too much, grease can be expelled at high pressure and cause serious injury. Injury could also result if the grease nipple is loosened. Never loosen the grease nipple.

Remove screws and cover to access the adjustment system.

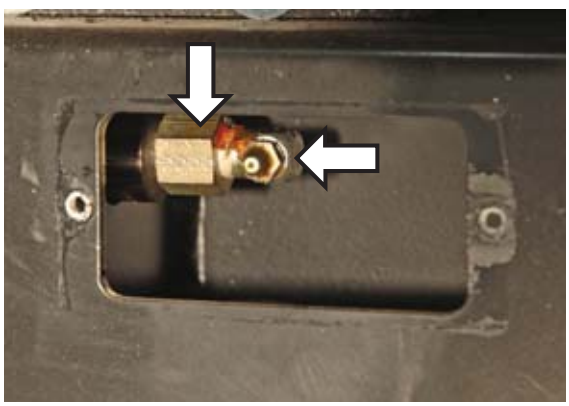
To tighten the track, connect a grease gun to the nipple and add grease to the system. When the track stretches to the correct tension, stop adding grease. Clean off any excess grease.

To loosen the track, turn hex shaped valve counterclockwise until grease comes out. When correct track tension is obtained, turn valve clockwise and tighten it. Clean off any expelled grease.

Replace access cover and tighten down with screws.



PH03300-9-18-06



PH03301-9-18-06

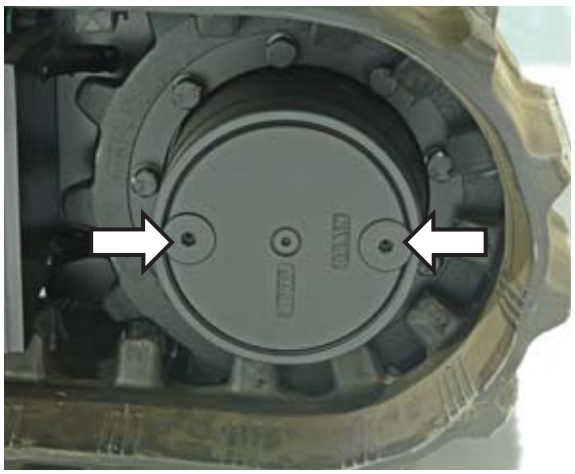
TX02632-6-20-06

Check Oil Level in Gearbox

Check the oil level in the gearbox every 100 hours of operation.

To check the oil level, stop the machine with the gear motor plugs aligned horizontally. Remove the plugs and check that the oil level is up to the plug holes. If oil needs to be added, fill through one of the holes while checking the other hole for the oil level.

Replace the plugs and tighten.



PH03299-9-18-06

TX01474-2-25-98

Changing Oil in Gearbox

Replace the oil after the first 200 hours of operation. Subsequent oil changes should be scheduled at least once a year or every 1000 hours.

To replace the oil, stop the gearbox with the gear motor plugs aligned vertically.

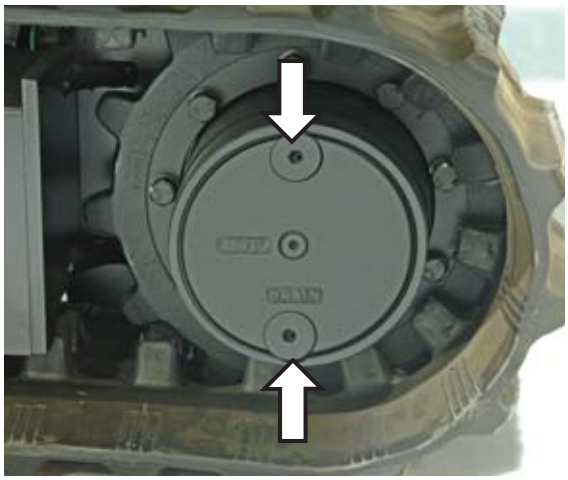
Remove both plugs and drain out all oil.

Move machine until the plug holes align horizontally.

Fill the gearbox through one of the holes while checking the other hole for the oil level. The oil level should be up to the plug holes.

Use SAE-30-CD oil to fill the gearbox.

Replace the plugs and tighten.



PH03298-9-18-06

TX02633-6-20-06

Adjusting Heater Temperature

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

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

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

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

TX02009-3-13-02

PH04810-10-24-12

Heater Indicator Light

The heater has a red indicator light to the right of the heater temperature knob. When the heater is turned on and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

TX04534-10-24-12

PH04810-10-24-12

Maintenance Checklist

TracStar® 500 series 3

	TRACSTAR INSPECTION CHECKLIST	OK	Repairs Made	Date Repaired
1.	For engine maintenance & service, Review engine manual			
2.	Machine is clean			
3.	Inserts and inserts keeper pins are with machine			
4.	All nuts & bolts are tight			
5.	All identification placards are on unit			
6.	Hi/Lo adjustment threads are lubricated			
7.	Wiring, battery cables, & all electrical terminals			
8.	Rubber tracks in good repair			
9.	Hydraulic oil is visible in reservoir sight glass			
10.	No visual oil or water leaks (engine and hydraulic system)			
11.	Fuel tank is full (diesel only)			
12.	Engine crankcase is filled to correct level (oil)			
13.	Cooling system level is correct (per engine manual)			
14.	Hydraulic hoses are in good condition			
15.	Engine starts and runs properly			
16.	Facer works properly			
17.	Heater in good condition (no nicks or gouges)			
18.	Surface temperature check with a pyrometer			
19.	All indicators work properly			
20.	Three position throttle control works properly			
21.	No damage to lift points and tie downs			
22.	Low oil / voltage & high water temperature alarm works			
23.	Primary pump pressure (2300 psi)			
24.	Hydraulic carriage works smoothly			
25.	Inspect facer blades for damage and sharpness			
26.	All grease points lubricated			
27.	Inspect jaw and insert serrations for wear			

Inspector: _____ Date: _____

Comments: _____

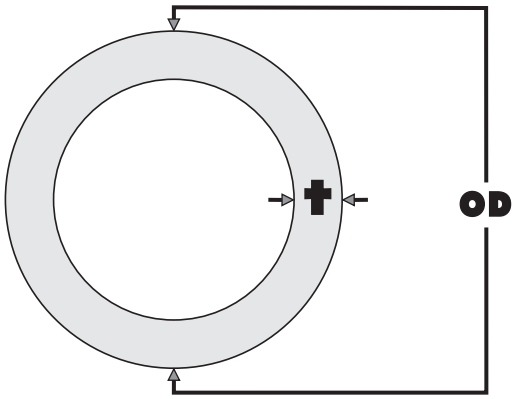
_____

TX04533-10-24-12

Determining Fusion Pressure

Variable Definitions

O.D. = Outside Diameter of Pipe (inch)
t = Wall Thickness of Pipe (inch)
∏ = 3.14
SDR = Standard Dimensional Ratio of Pipe (unitless)
IFP = Interfacial Pressure of Pipe (PSI)
TEPA = Total Effective Piston Area of Carriage Cylinders (inch²)

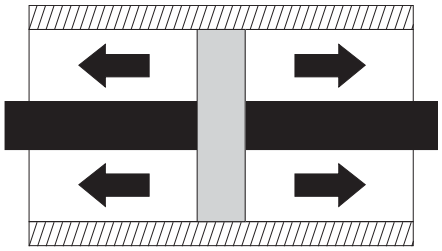


Formulas

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

PIPE AREA = (O.D. - t) x t x ∏
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 (in²)

Fusion Model	High Force	Medium	Low Force
A160/A180 A250	-	-	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 fluid is mandatory to achieve maximum performance and machine life. Use a clean, high quality, anti-wear hydraulic fluid 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 fluid temperature (generally 80°F above ambient). Using hydraulic fluids that do not meet these criteria may cause poor operation and/or damage to the hydraulic components.

The following table specifies the fluid temperature at various viscosities. Temperature rise of the hydraulic fluid 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 fluid is installed at our factory. The advantage of this fluid is a wider temperature range, however, this fluid 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

TX03082-2-26-14

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

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

Specifications

Fusion Machine Dimensions

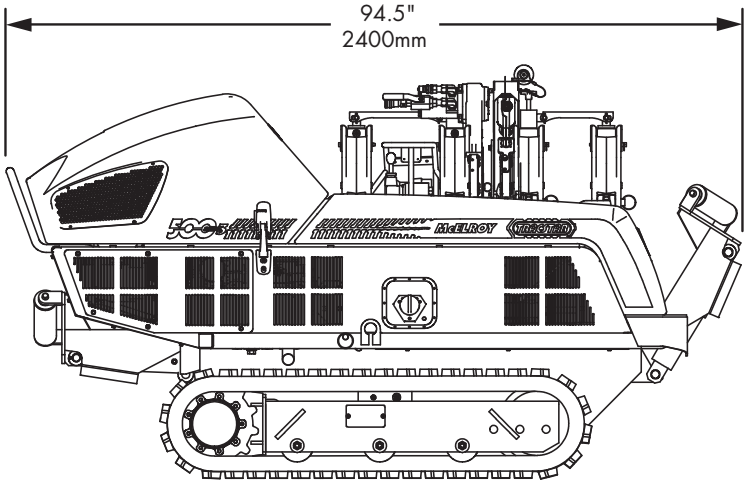
Length, Pipe Lift up: 94.5" (2,400mm)

Track Width: 50.5" (1,283mm)

Overall Width: 67.5" (1,715mm)

Centerline Height, Carriage: 32.5" (826mm)

Overall Height: 53" (1,346 mm)



Fusion Machine Weights

Total Vehicle Weight (fluids full): 3123 lbs (1,417kg)

Carriage, 4 Jaws: 750 lbs (340kg)

Carriage, 3 Jaws: 365 lbs (166kg)

Facer: 98 lbs (45kg)

Heater: 63 lbs (29kg)

Heater Stand: 17 lbs (8kg)

Facer Stand: 21 lbs (10kg)

Specifications

Maximum Pipe Diameter: 20" (500mm)

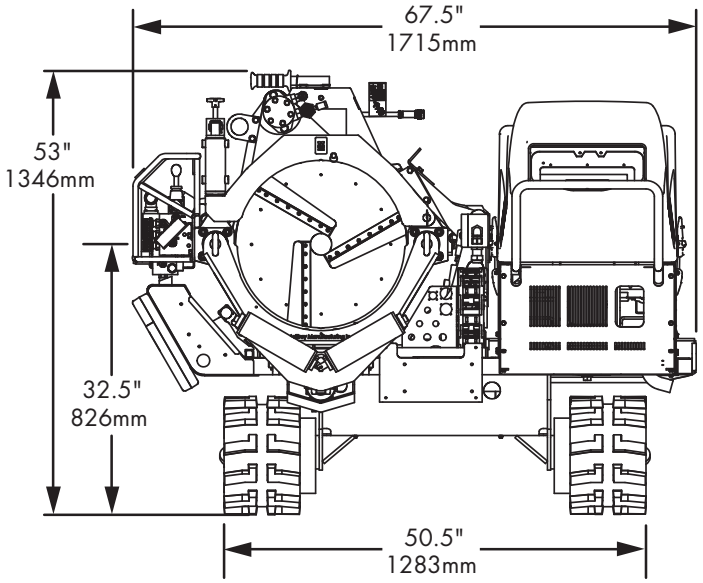
Minimum Pipe Diameter: 6" (180mm)

Effective Piston Area: 6.01 sq in (38.7 sq cm)

Maximum Force: 13,823 lbs (6,270kg)

Travel Speed: Low Speed 1.18 mph

High Speed 2.08 mph



Power Pack

23.5 hp (17.5kW) 1001 cc, 3-cylinder, Liquid Cooled Diesel Engine

11 gal (42 liters) Fuel Capacity

Operational Fuel Capacity (Auto Throttle): 11 hours

2,300 PSI (158 bar) Operating System pressure

12 gal (45 liters) Hydraulic Reservoir

6,500W Direct Drive Alternator

TX02008-9-7-11

About this manual . . .

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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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