

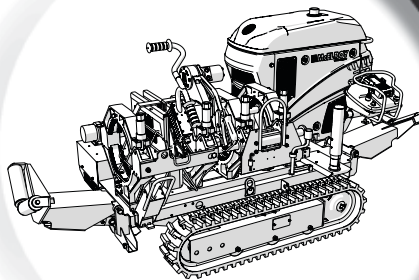
Operator's Manual



McELROY

www.mcelroy.com

TracStar® 28/250 412/618 Series 2 Auto Fusion Machines



Original Language: English

Manual: T1829801 Revision: B 03/19

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

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 choosing McElroy

The McElroy TracStar® Series 2 Auto 28/250/412/618 machines are self-contained, self-propelled, all terrain fusion machines, and are designed to butt fuse polyethylene pipe.

The Coach® Fusion Control system guides the operator through a step-by-step procedure for fusing pipe. It has built-in data logging feature that keeps a record of each fusion joint, which allows you to verify joint integrity.

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

The TracStar® 28 model fuses 2" IPS (63mm) minimum to 8" DIPS (225mm) maximum pipe.

The TracStar® 250 model fuses 63mm (2" IPS) minimum to 250mm (8" DIPS) maximum pipe.

The TracStar® 412 model fuses 4" IPS (110mm) minimum to 12" DIPS (340mm) maximum pipe.

The TracStar® 618 model fuses 6" IPS (180mm) minimum to 18" IPS (450mm) maximum pipe.

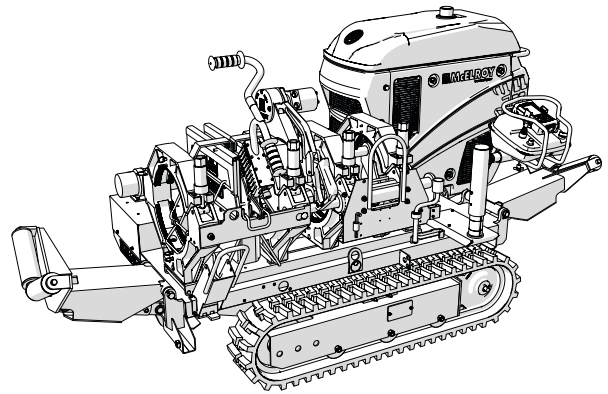
Different force cylinders are available machine models in low force, medium force and high force cylinders.

TX05273-03-28-17

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



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.

TX04659-03-24-14



MU203-13-14

Warranty

LIMITED WARRANTY

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

RETURN OF GOODS

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

McElroy Manufacturing, Inc.
P.O. Box 580550
833 North Fulton Street Tulsa, Oklahoma 74158-0550
PHONE: (918) 836-8611, FAX: (918) 831-9285.
EMAIL: fusion@McElroy.com

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

DISCLAIMER OF LIABILITY

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

McElroy makes no other warranty of any kind whatever, express or implied; and all implied warranties of merchantability and fitness for a particular purpose which exceed the 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

Safety Alerts



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

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



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



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



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



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

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

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

TX00030-12-1-92

WR00051-1-30-92

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.



TX02946-4-15-09

WR00052-12-1-92

Safety

General Safety

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

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

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

FEEL any changes in the way the equipment operates.

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

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



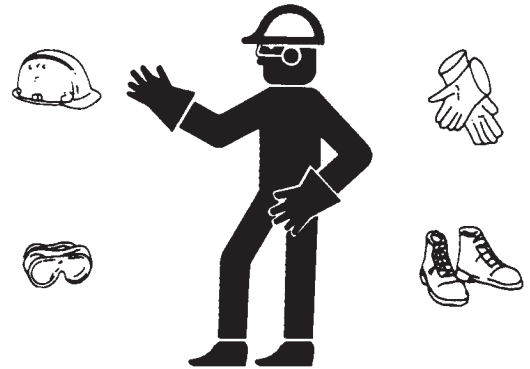
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TX00114-4-22-93

Wear Safety Equipment

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

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



WR00053-12-2-92

TX00032-04-18-16

Fuel Handling



Gasoline and diesel fuels are extremely flammable, and their vapors will explode if ignited.

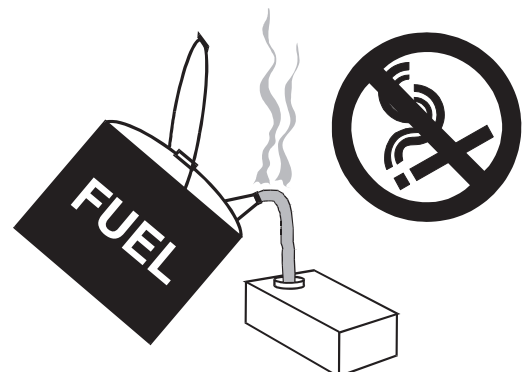
Do not fill the fuel tank while the engine is hot or running, as spilled fuel could ignite.

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

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

Make sure the fuel tank cap is closed tightly and properly secured.

Avoid repeated or prolonged fuel contact with skin or breathing of fuel vapor.



CD000365-2-19-97

TX00953-04-18-16

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 vehicle in a safe area by using hydraulic extension hoses to the carriage.

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



WR00080-4-12-93

TX04881-03-14-16

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.



WR00093-5-14-96

TX00954-04-18-16

Do Not Operate 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.

If operating in an explosive atmosphere, the carriage must be removed from the vehicle and the vehicle must be operated in a non-explosive atmosphere. The heater should be brought up to temperature in a non-explosive atmosphere, then unplugged before entering the explosive atmosphere for fusion.



WR00080-4-12-93

TX00796-04-18-16

Safety

Pipe Handling Safety

⚠️ WARNING Do not position yourself or any other personnel under supported or raised pipe. Pipe is heavy and could fall unexpectedly.

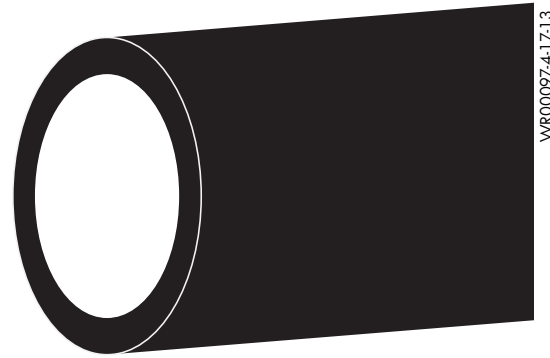
⚠️ WARNING Pipe that is bent can store a great amount of energy. Do not bend and force the pipe into the machine. A bent pipe with stored energy can generate tremendous force when that energy is released.

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

NOTICE: Do not leave machine unattended to unauthorized personnel. Do not allow unauthorized personnel to operate the machine.

Keep persons that are not involved in handling pipe away from pipe handling operations. Keep away from the pipe when the pipe and handling equipment are in motion. When 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.

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



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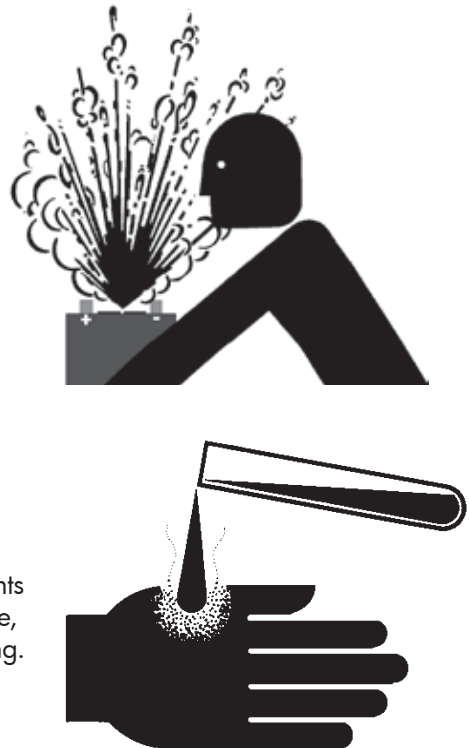
Battery

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

⚠️ WARNING The battery contains acid that can cause burns. Do not allow battery fluid to contact your skin, eyes, fabrics, or painted surfaces. After touching a battery 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, for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.



TX00650-04-18-16

CD001769-14-95

CD001779-14-95

Safety

Electrical Safety

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

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

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.

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



WR00055-4-7-93

WR00025-11-30-92

TX03003-3-30-11

Crush Points

⚠️WARNING Hydraulically operated equipment operates under high pressure and generates extremely high forces. Anything inadvertently caught in the machine will be crushed. Keep fingers, feet, arms, legs, and head out of the machine while operated. Always ensure machine power is off before entering the machine for any reason.



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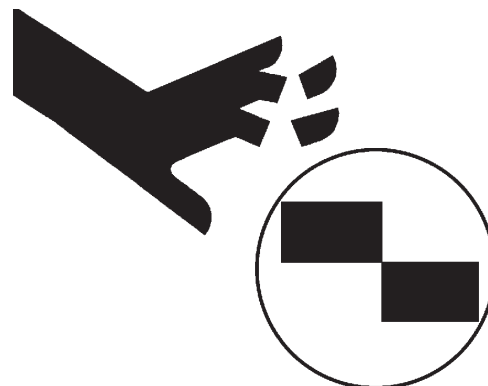
TX03004-04-18-16

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: Turn machine off, disconnect machine power, and remove the facer blades before attempting any maintenance or adjustment.

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



WR00073-4-6-93

TX02378-04-18-16

Safety

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 or oil temperature 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.

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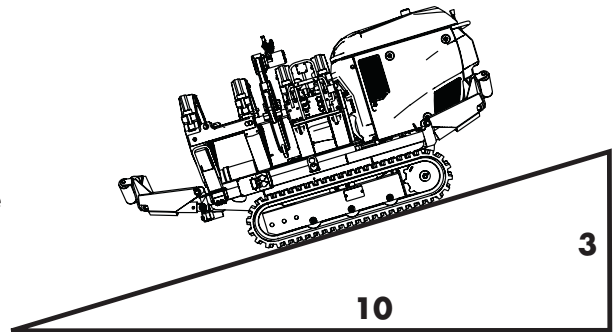
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Positioning and Setting Fusion Machine

Place fusion machine on as level ground as possible.

If it is necessary to operate machine on unlevel grade, make sure that the ground is stable. Some unstable conditions may be ice, snow, mud and loose gravel.

WARNING For operation safety, never operate the machine on a grade steeper than 30 %. (A 3 foot elevation change in 10 feet)

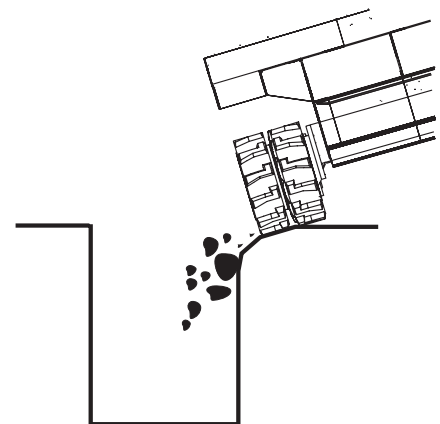


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TX01902-3-30-11

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 personnel injury and equipment damage resulting from a cave-in.



CD00408b-9-27-00

TX01447-04-18-16

Safety

Heater Is Hot

⚠ CAUTION

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

NOTICE: Use only a clean dry lint free non-synthetic cloth to clean the heater butt plates.

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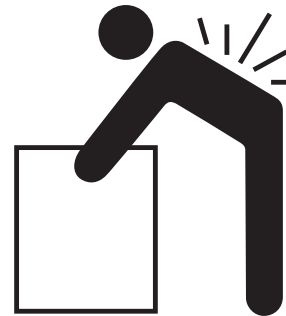
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Personal Lifting Safety

⚠ CAUTION

The machine components are heavy. Using one person to lift the facer or carriage may result in an injury. Use a lifting strap and an overhead lifting device to lift facer or carriage. For manual lifting, two people are required to lift the facer or carriage.

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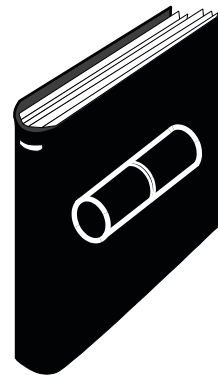
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Fusion Procedures

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

NOTICE: Failure to follow the pipe manufacturer's fusion procedures or appropriate joining standard could result in a bad fusion joint.

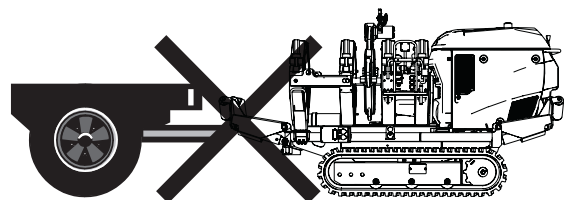
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WR00079-1-24-96

Do Not Tow TracStar

NOTICE: The TracStar is not designed for towing. The tracks will not move. Attempting to tow the TracStar will result in machine damage. Always transport the machine by flatbed trailer or similar means, and make sure the unit is properly secured.



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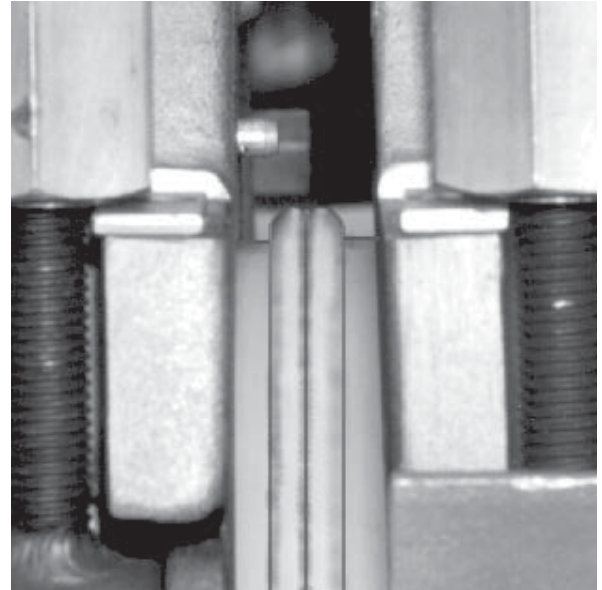
Overview

Theory of Heat Fusion

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

The principal operations include:

- Clamping** The pipe pieces are held axially and radially to allow all subsequent operations to take place.
- Facing** The pipe ends are faced to establish clean, parallel mating surfaces perpendicular to the centerline of the pipes.
- Aligning** The pipe ends are aligned with each other to minimize mismatch of the pipe walls.
- Heating** A melt pattern that penetrates into the pipe is formed around both pipe ends.
- Fusing** The melt patterns are joined with a specified force, which is constant around the pipe interfacial area.
- Cooling** The fusion joint is held immobile with a specified force until adequately cooled.
- Inspecting** Visually examine the entire circumference of the joint for compliance with the standard or fusion procedure used.



PH003638-1-4-96

Overview

Carriage Assembly

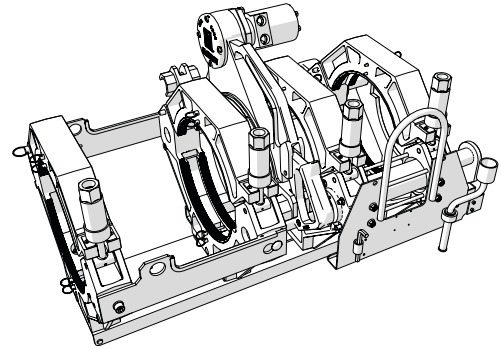
The carriage assembly consists of two fixed jaws and two hydraulically operated movable jaws.

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

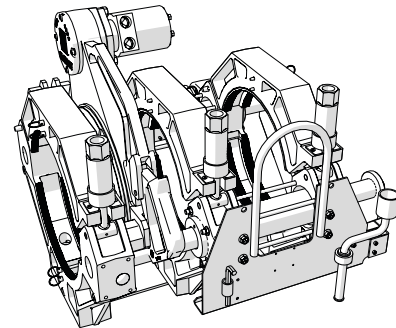
The outer fixed jaw can be removed to allow more area to fuse tees or perform tie-ins easier.

The two moveable jaws and inner fixed jaw can be removed in a 3-Jaw configuration for remote operation from the carriage.

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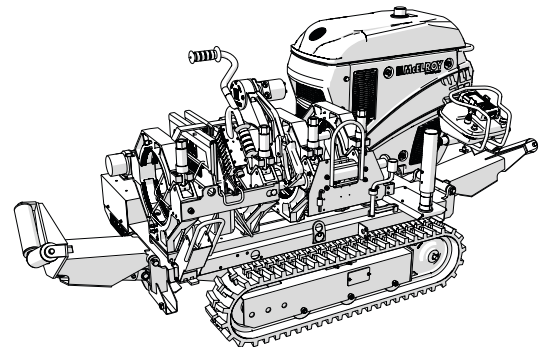
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Chassis

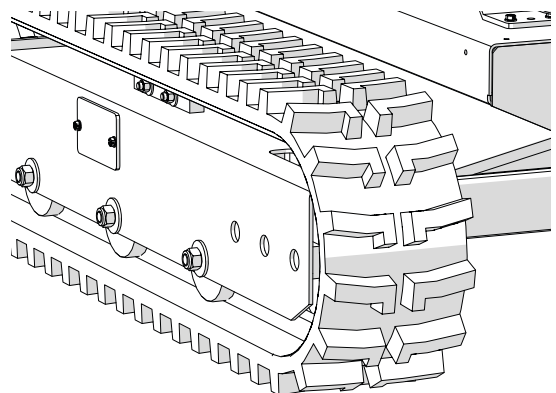
The carriage assembly is mounted on a track driven chassis for easy loading and movement along the pipe line.

The engine powers an alternator, used to power the heater, and a hydraulic pump, which powers the fusion machine and the track drive. The hydraulic reservoir is mounted above the engine. The fuel tank and battery are installed between the tracks.

TX02317-10-25-04



CD01854-11-16-16



CD01785-08-04-16

Overview

Diesel Engine

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

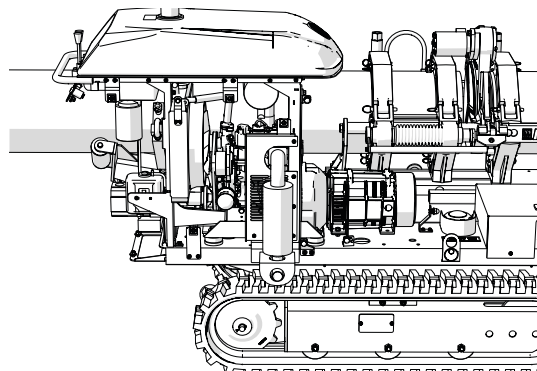
The engine is a 3 cylinder water cooled design. It uses an electric fuel pump located near the fuel tank.

The throttle control and key switch are at the rear of the machine. Turn the key switch to the left to preheat the glow plugs and then to the right to start the engine.

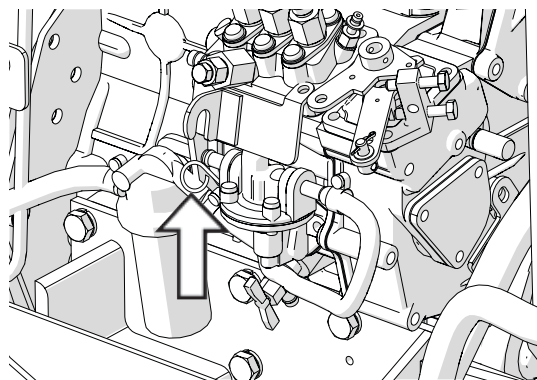
The engine is equipped with an oil pressure switch and coolant temperature switch that will sound an alarm at low oil pressure or coolant temperatures exceeding 230°F.

If you hear the alarm while operating the machine, turn the machine off and check oil level. If oil is at proper level, wait for machine to cool and then check coolant level and mixture.

The fuel shut off valve is located on the engine mounted fuel filter.



CD01858-11:16-16



CD01790-08:17-16

TX02542-9-15-05

Operator Panel

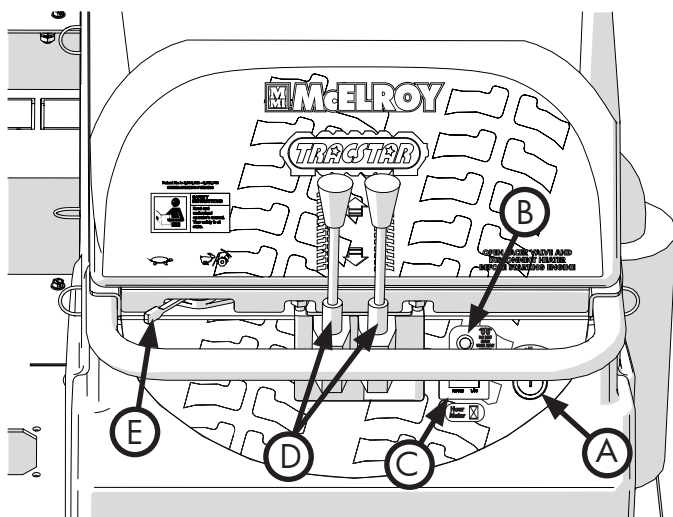
A - Key switch - Switch to start and stop the machine.

B - Wait Light - Indicate the engine is pre-heating and will turn off once engine pre-heat is complete.

C - Hour Meter - With the key switch in the run position, total hours of operation are displayed.

D - Track Controls - Used to control the movement of the left and right tracks.

E - Engine Throttle Control - Adjust the engine speed from low to high.



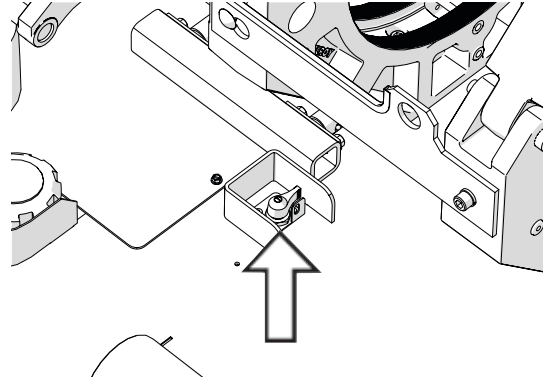
CD01849-09:21-16

TX05160-09-22-16

Overview

Battery Disconnect Switch

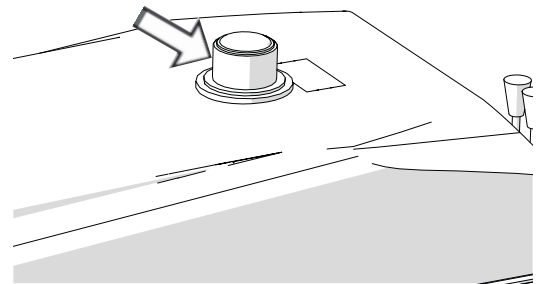
The battery disconnect switch removes the battery power to the system.



TX05161-09-22-16

Hydraulic Fluid Reservoir

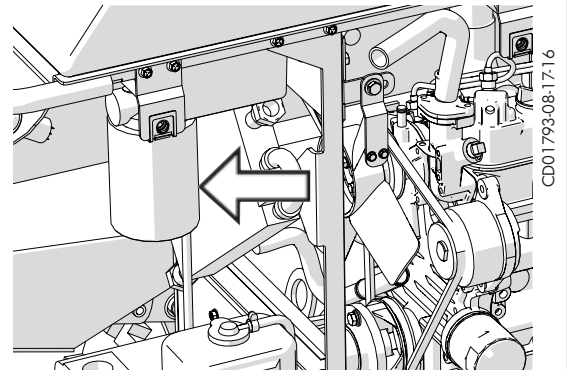
The hydraulic fluid reservoir is located above the engine.
Refer to the "Hydraulic Fluids" section of this manual for hydraulic fluid recommendations.



TX02322-02-27-14

Hydraulic Fluid Filter

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



TX01893-02-27-14

Overview

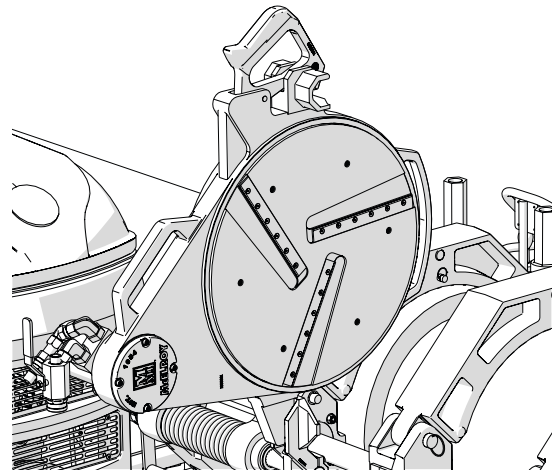
Facer

The facer is a rotating planer-block design. The blade holders each contain blades and are chain driven (enclosed in lubricant) by a hydraulic motor. There are facer stops that allow for a specific amount of faced pipe to protrude from the jaws.

When needed for off-vehicle modular operation, the facer can be removed from its carriage skid-mounted pivot arm.

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

TX05163-09-22-16



CD01795-08-17-16

Heater

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

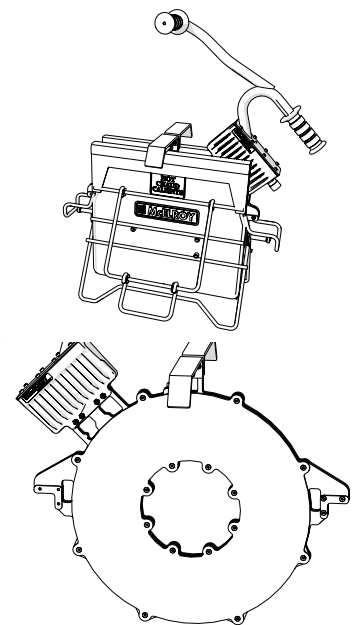
If operating in an explosive atmosphere, heater should be brought up to temperature in a safe environment, then unplugged before entering the explosive atmosphere for fusion.

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

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

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

TX05276-03-06-17



CD02025-03-06-17

CD01798-08-17-16

Self Retracting Heater

TracStar 412 can be optioned with a self retracting heater mounted to machine carriage. Throughout operation instructions, any deviation in operation for this style heater will be noted as Self Retracting Heater.

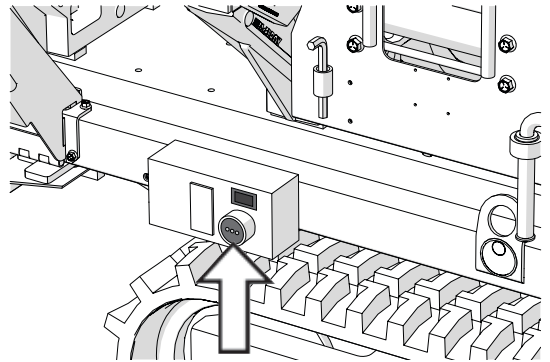
During the Automatic fusion process the heater will be removed from the carriage automatically.

TX05364-04-16-18

Overview

Power for Heater

The heater cord plugs into the receptacle on the frame. There is a voltage meter above the receptacle that displays the output voltage.

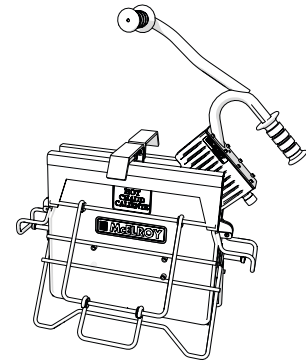


CD01863-04-12-17

TX05289-04-12-17

Insulated Heater Stand/Shroud

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

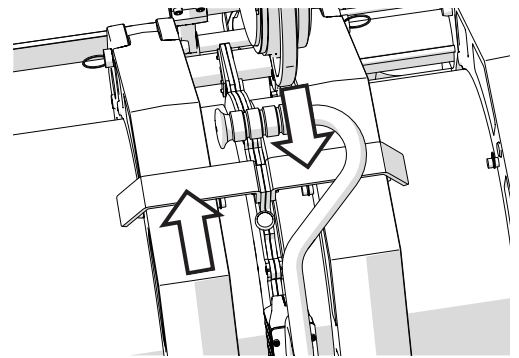


CD02025-03-06-17

TX00363-9-15-94

Heater Stripper Bar (Top Loading Heater)

The heater is equipped with a stripper bar that is used to separate the heater from the pipe ends after the heating cycle. When the inner jaws are opened, the jaws lift and press against the stripper bar separating the heater from pipe ends.



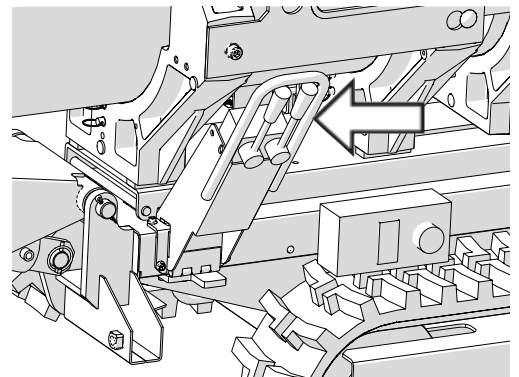
CD01799-08-17-16

TX05355-04-09-18

Pipe Lift Controls

Hydraulic pipe lifts are used to aid in positioning pipe in the machine.

The pipe lift control bracket can be loosened and rotated down from the vehicle to allow clearance to fuse tees or elbows.



CD01865-11-29-16

TX05164-04-06-17

Overview

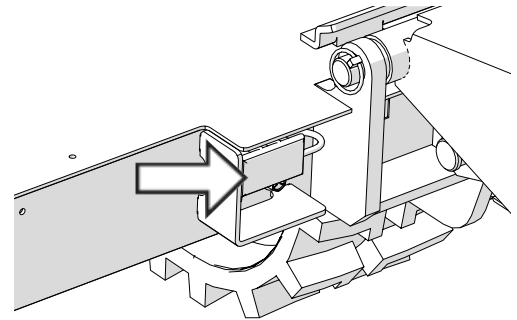
Battery Charging Connection

The battery can be charged or jump started using the battery charging connection on the front of the machine.

IMPORTANT: The battery disconnect switch must be in the connected position to charge battery.

The plug type for the charging connection is an Anderson Power Products SB175 connector.

TX05165-04-06-17



CD01848-09-21-16

The Coach® McElroy Fusion Control Pendant

The fusion control pendant is the operator interface for machine fusion controls and is used to control pressures and times to meet selected fusion standards.

The control pendant is equipped with a handheld computer which operates the fusion control system program.

A - Carriage directional control.

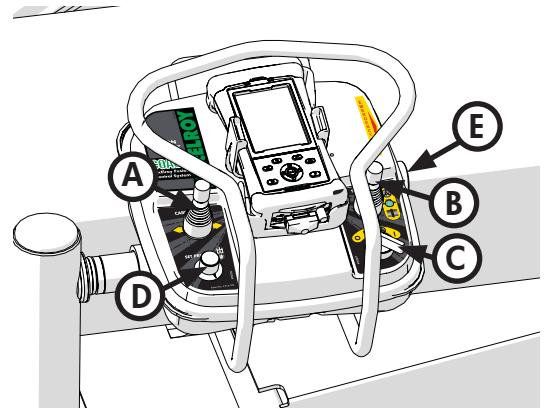
B - Pressure selector control.

C - Facer on/off control (**Not Used**).

D - Carriage pressure adjustment knob.

E - Red emergency stop button. Push in on the button to shut down the system. The button must be pulled out to resume operations.

TX05198-12-05-16



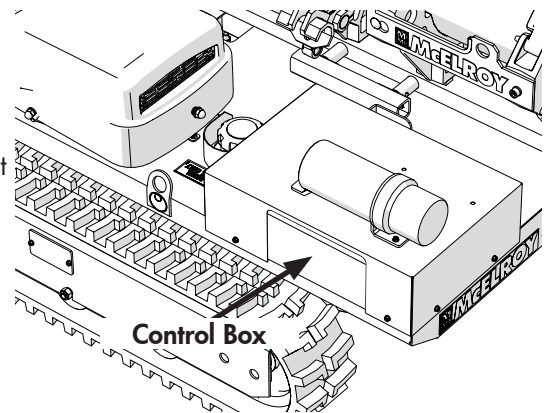
CD01859-11-16-16

Control Box

The Control Box contains the electronics that operate the system. There are lights that indicate the status of the system as well as a fuse box.

There are no serviceable parts inside the Control Box and must be sent to McElroy for repair.

TX05199-03-06-17

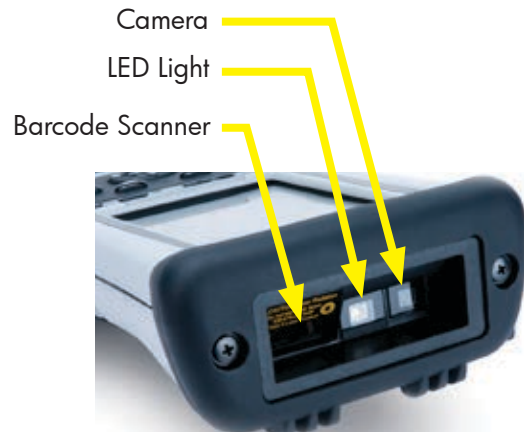
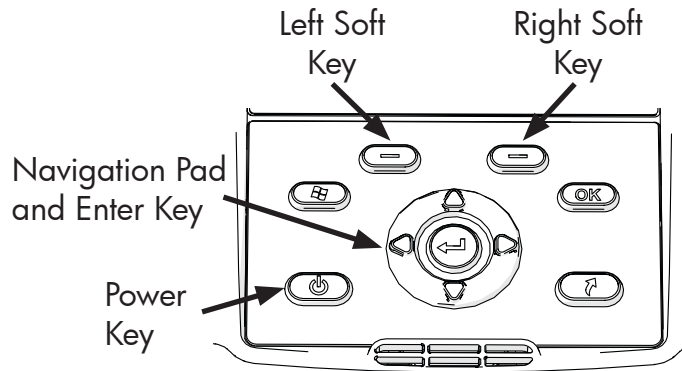
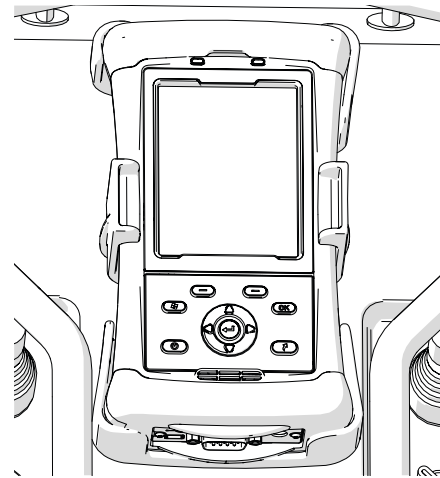
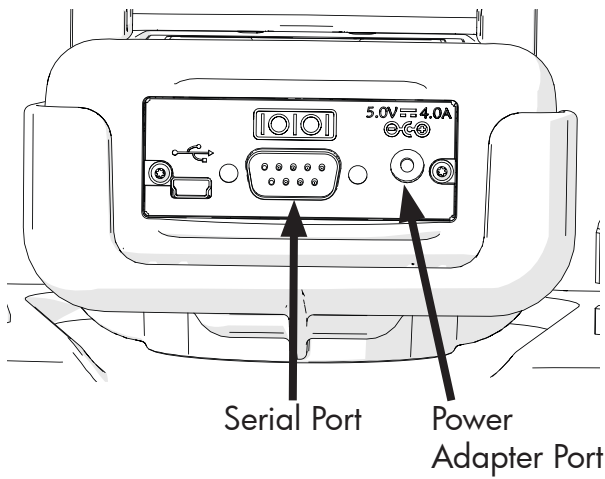


CD01860-11-16-16

Overview

Pendant Handheld Computer

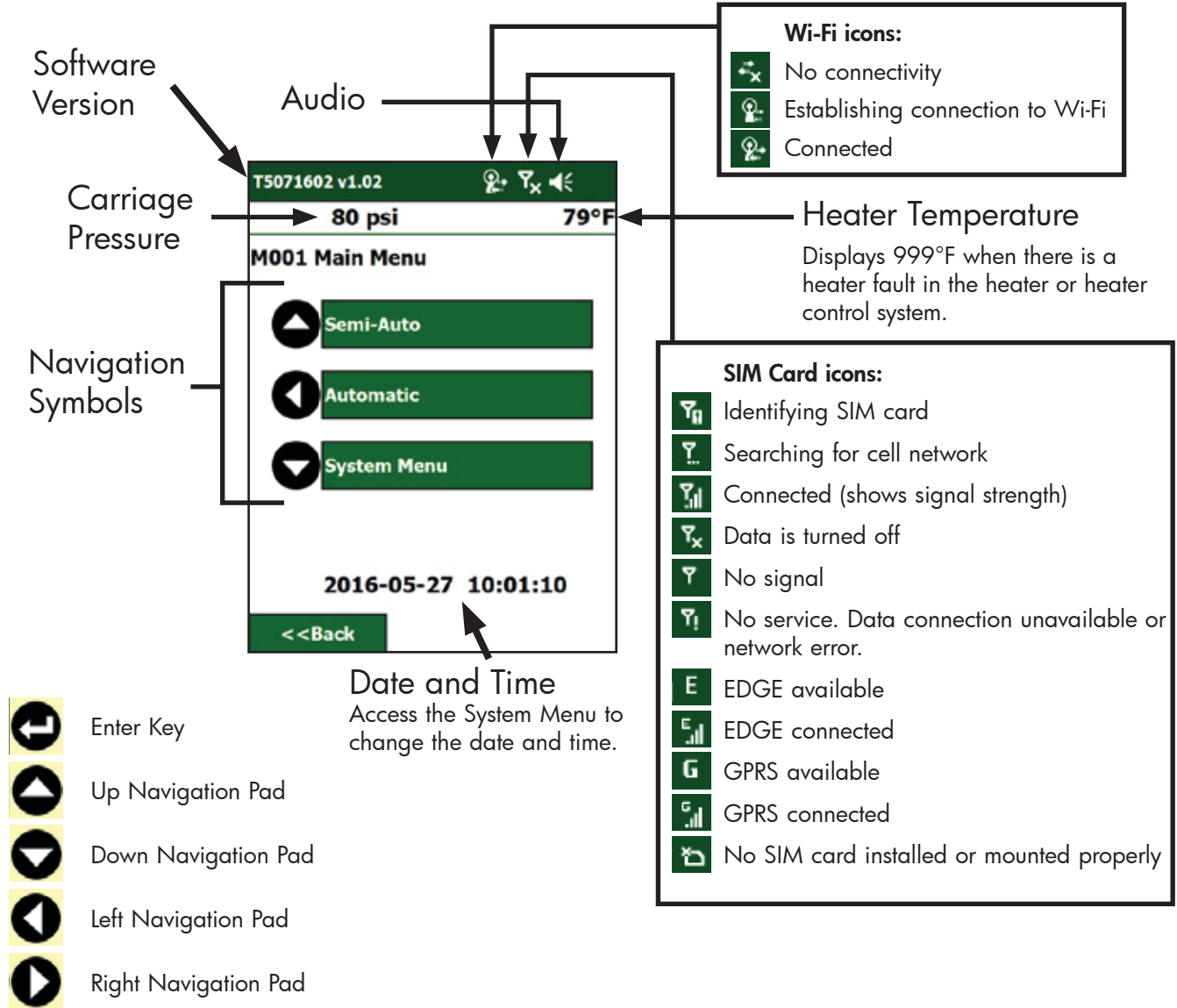
The handheld computer is a compact and rugged computer mounted to the pendant base and connected using a serial cable and the power cable. The computer has a display with function keys below the display that are used to operate the installed software. The software can also be operated by the touch screen.



Overview

Pendant Computer Interface

The pendant computer software controls and logs the fusion process.



Overview

DataLogger® Vault™

The DataLogger® Vault™ is a software application from McElroy that provides joint data storage and analysis at no cost to users of the Coach McElroy Fusion Control Pendant. The DataLogger Vault is a secure, online application that allows users to view and analyze their joint data from almost any device, from almost any location. All that is needed is a device such as a PC, Mac, smartphone, tablet, etc. that has a browser and access to the Internet.

With features such as automatic grouping and sorting of joint data, custom tagging and filtering, it's very easy to sort, view and analyze joint data by job, operator, machine, etc. without having to re-key data into a spreadsheet or database application.

If you do not already have access to the DataLogger Vault, we recommend creating your free account prior to fusing pipe, so that you will be ready to take full advantage of the joint data collected.

To create your free DataLogger Vault account, and for more information (including complete instructions), visit: <http://vault.mcelroy.com>.

The screenshot displays the DataLogger Vault web application interface. The main content area shows details for a specific joint, including job number, date, operator, machine name, and pipe specifications. A table at the bottom lists pressure readings for different components.

| Pipe Specifications | | | |
|---------------------|---------|--|--|
| Pipe Material | PIE710 | | |
| PIE SIZE | 4" IS | | |
| Wall Thickness | 08 13.5 | | |

| Parameters | | | |
|----------------|------------|--------|--|
| Cramp Pressure | 25 psi | | |
| Input Pressure | Importance | Gauge | |
| Back-up | 75 psi | 84 psi | |
| Heat Sink | | 25 psi | |
| Flow | 75 psi | 84 psi | |
| Clad | | | |

Joint Information

PH04968-10-30-13

Operation - General

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.

TX00401-9-15-94



STOP-12-28-95

Check Hydraulic Fluid Level

Check fluid level in the reservoir and verify that fluid is visible in the strainer.

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

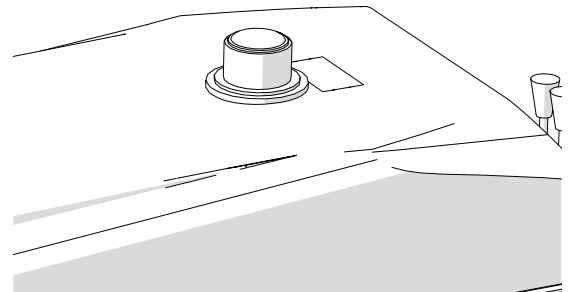
If fluid is not visible in the reservoir strainer, fill reservoir until fluid is visible in the strainer.

Do not overfill reservoir. The fluid will expand as it heats up.

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

Use only clean oil from an unopened container.

TX02323-02-27-14



CD01792-08-17-16

Diesel Engine

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

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

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

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

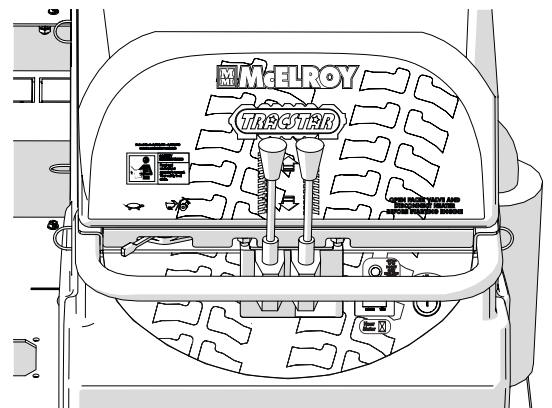
NOTICE: Set the engine to slow speed before starting. Never use starting fluid.

Open facer valve. Turn switch to the left to preheat, until the red glow plug lamp goes out. Turn the key to the right to start the engine. Close the facer valve to allow the machine to build pressure.

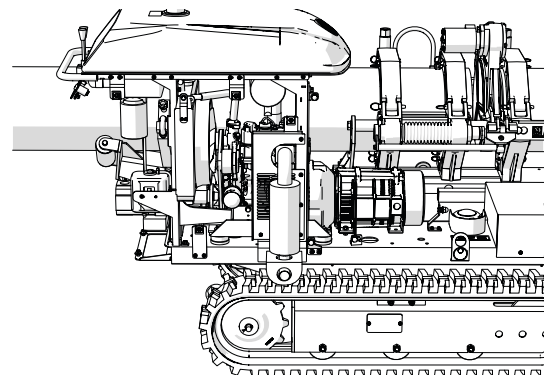
Turn the key to OFF to stop the engine.



TX05278-04-06-17



CD01849-09-21-16



CD01858-11-16-16

Operation - General

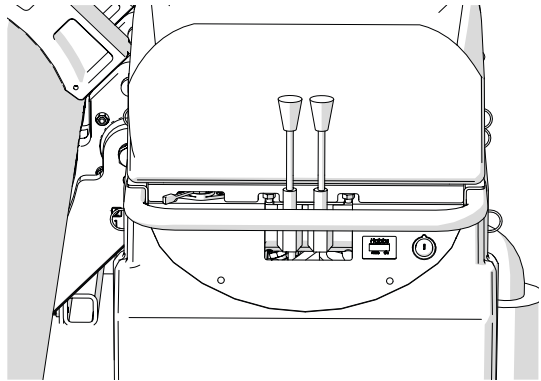
Moving Machine Into Position

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

Stand behind the machine console.

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. Pull levers back to back up.

TX01491-3-298



CD01788-08-17-16

Prepare Heater

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

Install butt fusion heater plates while heater is cool.

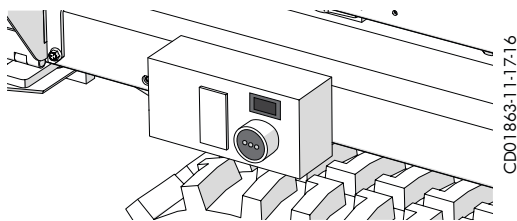
NOTICE: The heater should never be used without butt fusion heater plates installed. Refer to the "Maintenance" section of this manual for installation procedure.

Place heater in insulated heater stand or shroud.

Plug heater into the appropriate outlet on machine.

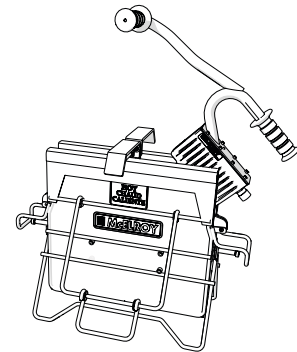
IMPORTANT: Engine must be in high speed to provide electric power to the heater.

Allow heater to warm-up to operating temperature.

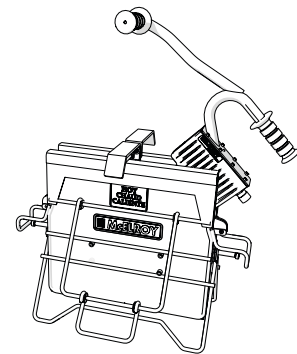


TX05279-04-06-17

CD01863-11-17-16



CD02025-03-06-17



CD02025-03-06-17

Set up Pipe Supports

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



TX02955-4-15-09

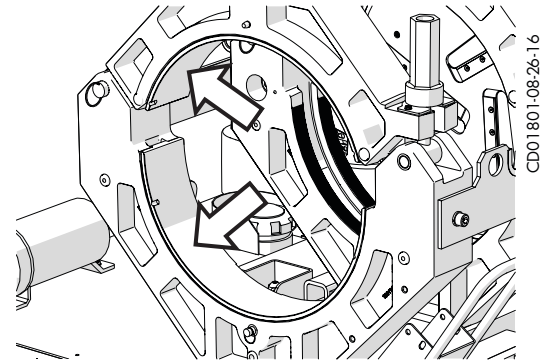
PH03879-4-15-09

Operation - General

Install Clamping Inserts

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

Clamping inserts are required for all sizes except sizes that match the size of the jaw without inserts.



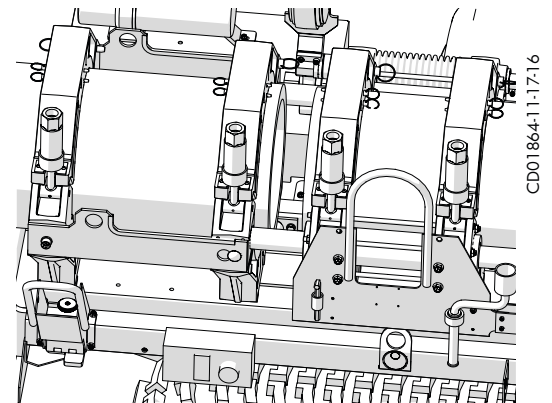
CD01801-08-26-16

TX02956-4-15-09

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. Position pipe with enough material protruding past the jaw faces to allow for facing of the pipe end.



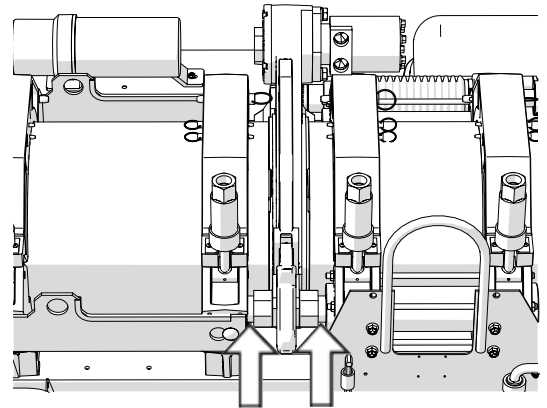
CD01864-11-17-16

TX02339-3-30-11

Operation - General

Positioning Pipe In Machine

Swing the facer into place. With the carriage control valve lever, move the carriage toward the fixed jaws, while watching the gap at each end of the facer rest buttons. 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. Tighten the clamp knobs on the outside jaws. Hand tighten the inside clamp knobs.



CD01861:1:16-16

TX00372-9-15-94

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.

To unclamp the jaws:

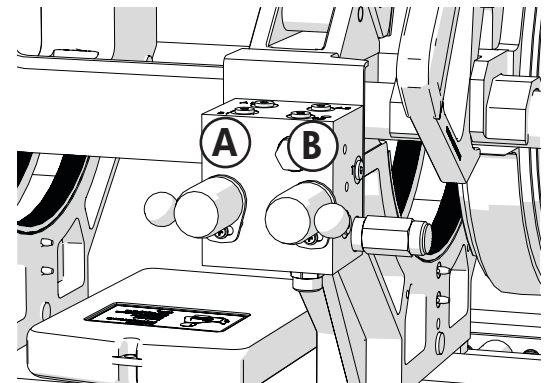
With your free hand, hold the tie bar between two cylinders.
Rotate the valve knob up to unclamp.
Pull the tie bar towards operator until the cylinders come to rest.

To clamp the jaws:

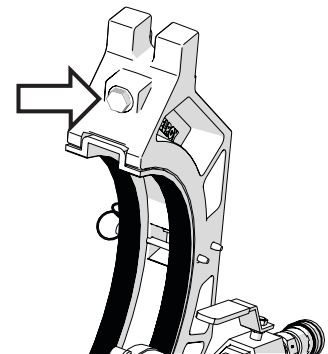
Push the cylinder tie bar toward the jaws until cylinders are vertical.
Rotate the valve knob down to clamp.

Hi/Lo adjustment:

Unclamp and open the inner jaw on the high side. Make adjustments to the Hi/Lo by adjusting the stop on the bottom of the inner upper jaws and then reclamp the jaw.



CD01887:12-06-16



CD01888:12-06-16

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.

TX05201-12-06-16

Operation - General

Begin Facing

Turn facer on by opening valve (A) on top of the facer.

Move the pressure selector control (B) to the top (facing pressure) position.

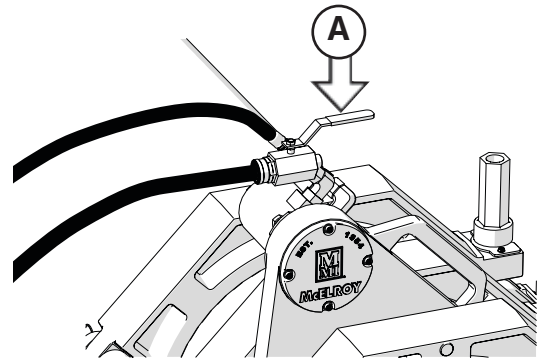
The facing pressure should be set as low as possible while still facing pipe. Excessive facing pressure can damage the facer. It may be necessary to adjust the facing pressure.

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 facer.

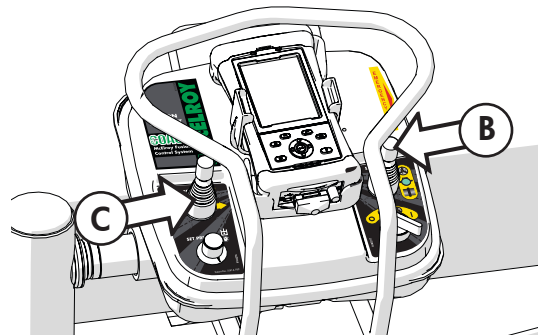
Move the carriage directional control (C) to the left to close the carriage and begin facing. Continue to face the pipe until the facer guide rod bracket bottoms out on the jaws (D).

Shift carriage directional control (C) to the center (neutral) position, and allow facer to turn 2 to 3 additional revolutions.

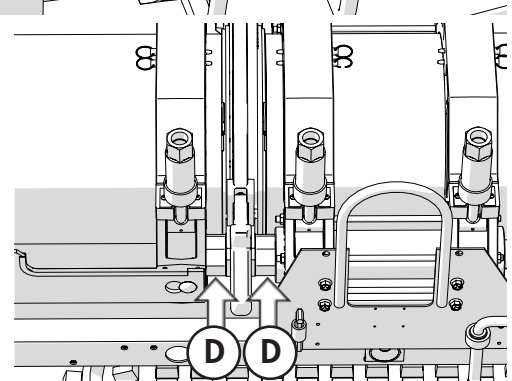
Turn facer off (A).



CD01805-08-31-16



CD01859-11-16-16



CD01862-11-16-16

TX05280-04-06-17

After Facing

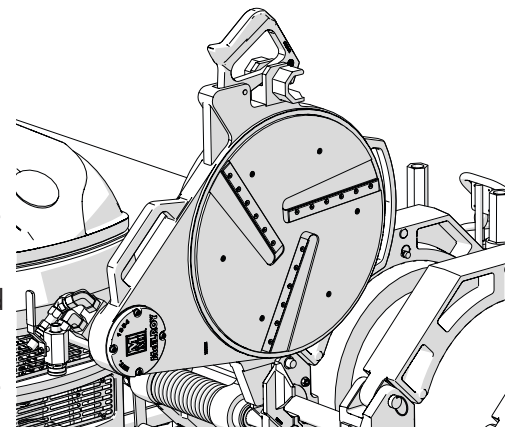
Move the carriage directional control to the right and allow the carriage to open completely. Center the facer in between the pipe ends to avoid dragging the guide rod bracket on the pipe ends. Swing facer to the out position.

Self Retracting Heater: The facer can be positioned to the right and locked into a detent to prevent the facer from floating.

WARNING Use the machine keyswitch to turn the engine off before entering the unit for maintenance or chip removal. Death or serious injury could result if the engine remains on and the hydraulics are activated while personnel are between movable machine parts.

Clean shavings out of pipe ends and from between the jaws. Do not touch faced pipe ends.

Use the machine keyswitch to restart the engine.



CD01795-08-17-16

TX05356-04-09-18

Operation- General

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 HI/LO misalignment between pipe ends, adjustments must be made. If HI/LO alignment is acceptable, proceed to "Check for Slippage".

To correct HI/LO misalignment:



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.

If pipe is not lined up, tighten the high side jaw to bring into alignment.

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

When the pipe is properly aligned, ensure all clamp knobs are tight.

NOTICE: When clamping, do not over-tighten the clamp knobs because machine damage can result. Check to see if there is space between the upper and lower jaws. If the two jaws are touching, do not continue to tighten.

Hydraulic Clamping Hi/Lo adjustment:

Unclamp and open the inner jaw on the high side. Make adjustments to the Hi/Lo by adjusting the stop on the bottom of the inner upper jaws and then reclamp the jaw.

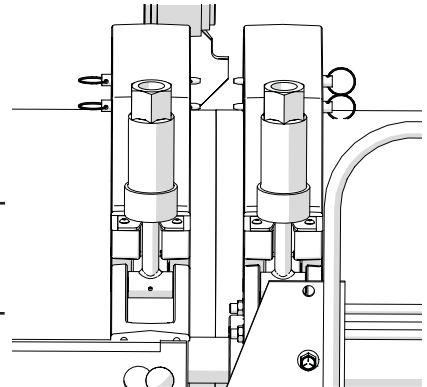
IMPORTANT: Always tighten the side that is higher, never loosen the low side.

Repeat adjustment until pipe is aligned.

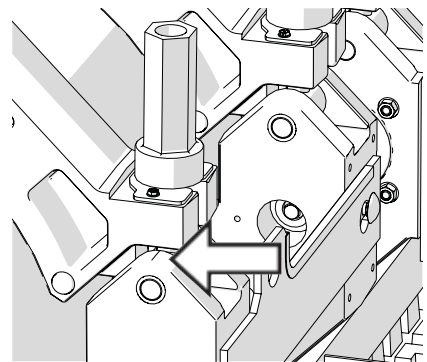
Insert facer and reface the pipe ends if adjustments were made. Check HI/LO alignment again and make further adjustments if necessary.

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

TX05200-04-06-17



CD01886-12-06-16



CD01806-08-31-16

Check Heater Temperature



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

NOTICE: Incorrect heating temperature can result in questionable fusion joints.

Check heater surface temperature where the pipe will contact the heater.

Compare the surface temperature with the displayed temperature on the handheld computer. Enter the difference in the System Menu > Check Heater Offset.

The dial thermometer on the heater body is for reference only and does not indicate heater butt plate surface temperature.

Refer to the pipe manufacturer's recommendations or appropriate joining standard for proper heater temperature.



WR00077-4-16-93

TX05282-04-06-17

Operation - General

Completing the Fusion Operation

The fusion operation can be completed by automatic fusion or by semi-auto fusion.

Automatic Fusion: The machine automatically performs all carriage movements to complete the fusion operation.

Refer to section "Operation - Auto Fusion" for instructions on completing an auto fusion.

Semi-Auto Fusion: The operator performs all fusion operations.

Refer to section "Operation - Semi-Auto" for instructions on completing a semi-auto fusion.

Confirm Machine Type:

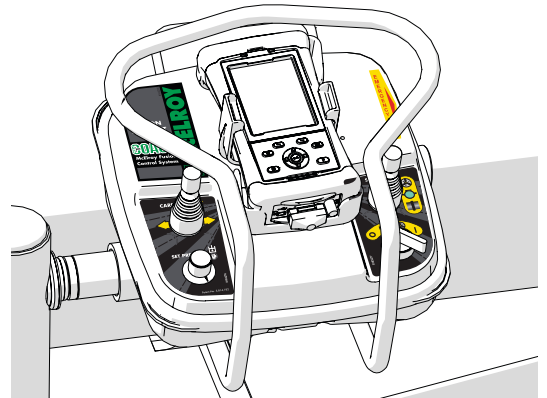
Select and confirm the machine type by tapping **Accept>>** at the bottom right. Tap **<<Change** to select a different machine type.

IMPORTANT: Verify the cylinder size of your machine and select the machine that matches your cylinder size.

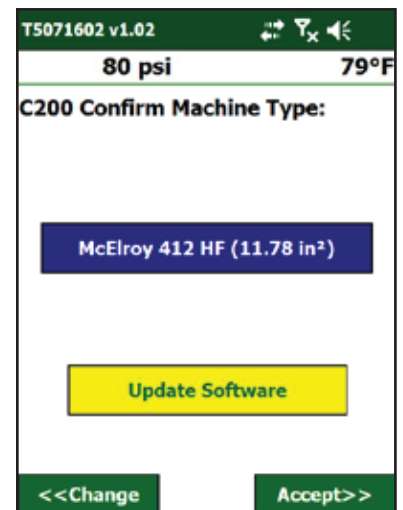
The Update Software button will appear if there is an update available. Tap the Update Software button to download and install the software update. A WIFI data connection is recommended for downloading updates.

Self Retracting Heater:

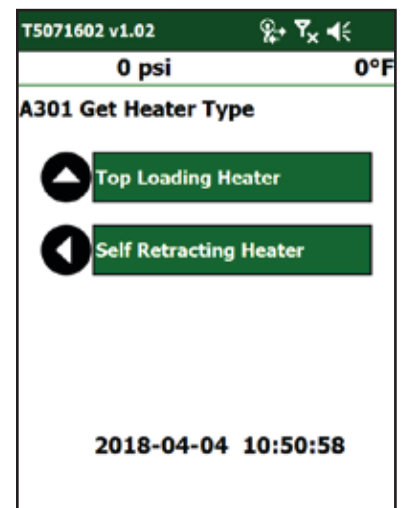
For machines with the self retracting heater option, an additional screen menu will appear. Select if your machine has a manual top loading heater or a self retracting heater.



CD01859-11-16-16



PH05645-03-22-17



PH05676-04-04-18

Operation - Auto Fusion

Auto Fusion

This section contains the procedure for setup and execution of the auto fusion operation. In this mode, the machine automatically performs all pressure adjustments and movements of the carriage to complete a fusion.

IMPORTANT: The "Operation - General" section must be completed before starting an auto fusion.

Main Menu:

Tap "Automatic" to proceed with the auto fusion operation.

Automatic Menu:

- **Fuse Pipe** - Proceed with fusion process.
- **Report Menu** - View joint report, send joint reports, or access/change DataLogger® Vault™ account. See "Auto Report Menu" section for details.

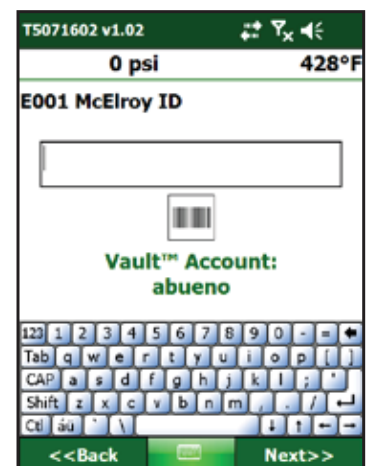
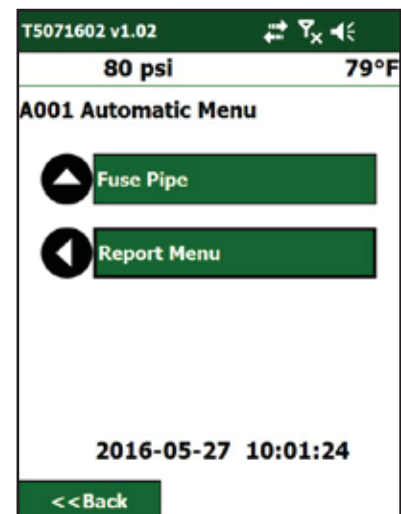
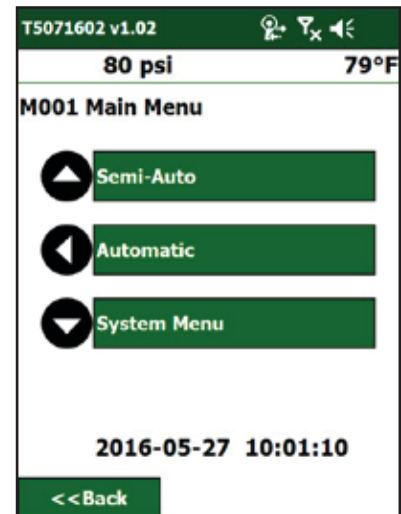
IMPORTANT: The information used in these examples is for simulation purposes only and does not reflect information of an actual fusion.

Enter a McElroy ID, if applicable, or tap the bar code symbol to turn on the bar code scanner and scan the bar code on the McElroy operator qualification wallet card.

Verify the correct Vault™ account is displayed. Change the user account by going to the Report Menu > DataLogger® Vault™ Account.

IMPORTANT: All fusion joint reports will be sent to the user account displayed, ensure the correct user account is displayed prior to fusing pipe.

Tap **Next>>** to proceed




Operation - Auto Fusion

Auto Fusion (continued)

Identifications:

Confirm if the identifications entered are correct. These identifications will be displayed in the joint report.

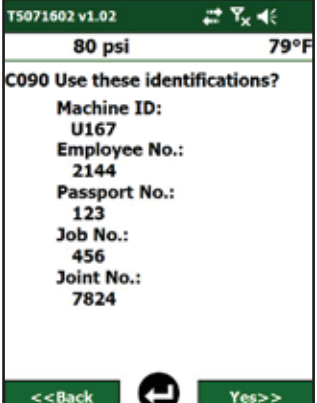
- Press  to change the identifications (System password may be required).
- Tap **Yes>>** to proceed with these identifications and proceed to "Parameters".

To Change the Identifications:

- Input a machine ID. The machine ID can be any machine identification given to the machine.
- Tap **Enter>>**.

- Input an employee number.
- Tap **Enter>>**.


- Input a passport number.
- Tap **Enter>>**.



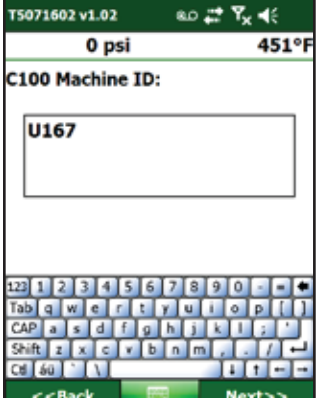
T5071602 v1.02 80 psi 79°F

C090 Use these identifications?

Machine ID:
U167
Employee No.:
2144
Passport No.:
123
Job No.:
456
Joint No.:
7824

<<Back  Yes>>

PH05535-04-06-17




T5071602 v1.02 0 psi 451°F

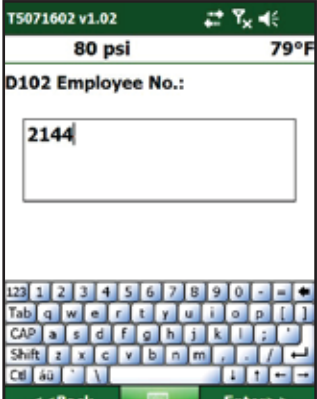
C100 Machine ID:

U167

123 1 2 3 4 5 6 7 8 9 0 - = *
Tab q w e r t y u i o p []
CAP a s d f g h j k l ; :
Shift z x c v b n m , . / < >
Ctrl áó ò ò ò ò ò ò ò ò ò ò

<<Back  Next>>

PH05620-04-06-17




T5071602 v1.02 80 psi 79°F

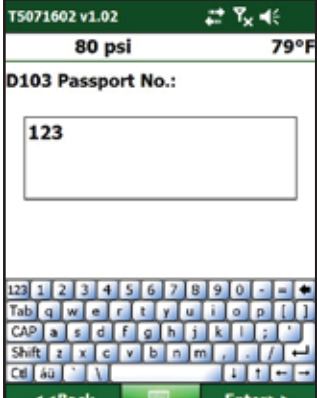
D102 Employee No.:

2144

123 1 2 3 4 5 6 7 8 9 0 - = *
Tab q w e r t y u i o p []
CAP a s d f g h j k l ; :
Shift z x c v b n m , . / < >
Ctrl áó ò ò ò ò ò ò ò ò ò ò

<<Back  Enter>>

PH05536-04-06-17




T5071602 v1.02 80 psi 79°F

D103 Passport No.:

123

123 1 2 3 4 5 6 7 8 9 0 - = *
Tab q w e r t y u i o p []
CAP a s d f g h j k l ; :
Shift z x c v b n m , . / < >
Ctrl áó ò ò ò ò ò ò ò ò ò ò

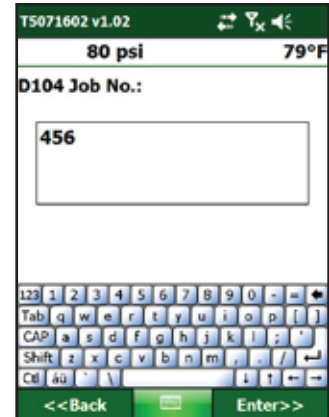
<<Back  Enter>>

PH05537-04-06-17

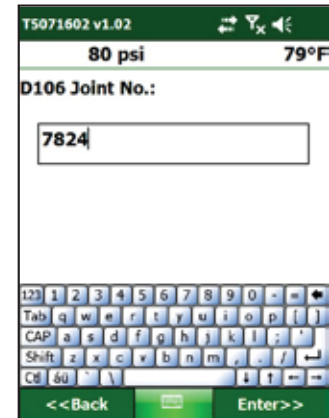
Operation - Auto Fusion

Auto Fusion (continued)

- Input a job number.
- Tap **Enter>>**.




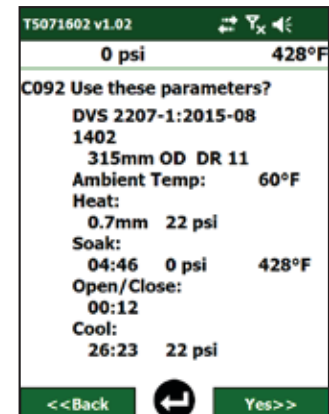
- Input a joint number.
- The joint number will increment up as fusion joints are completed.
- Tap **Enter>>**.



Parameters:

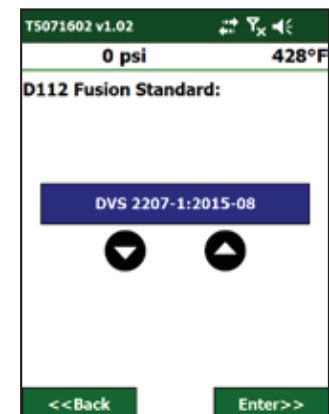
Confirm if the parameters listed are correct. These parameters will be displayed in the joint report.

- Press  to change the parameters.
- Tap **Yes>>** to proceed with these parameters.



To Change Parameters:

- Use up/down arrows to select the fusion standard to be used for the fusion process.
- Tap **Enter>>**.



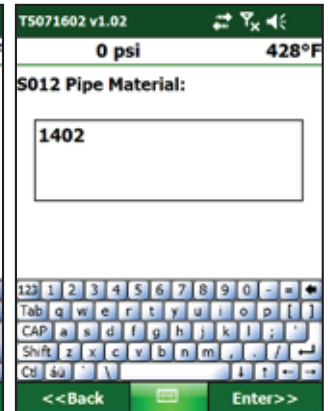
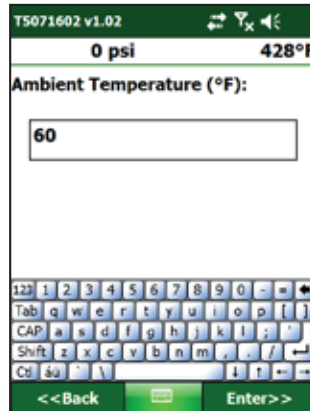
Operation - Auto Fusion

Auto Fusion (continued)

- Input the ambient temperature.

The temperature will be recorded in the units the device is set to in the system menu.

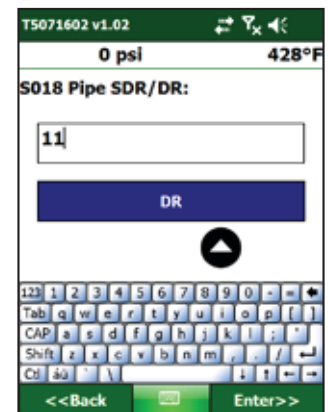
- Input the pipe material.
- Tap **Enter>>**.



- Input the pipe size and use the up/down arrows to select the appropriate units.
- Tap **Enter>>**.



- Input the pipe wall thickness and use the up/down arrows to select the appropriate units..
- Tap **Enter>>**.

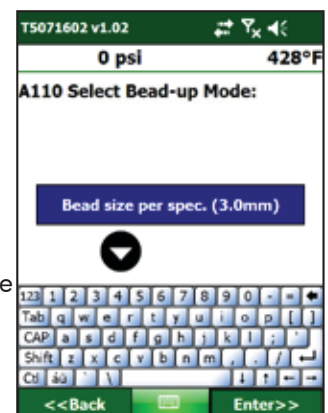


- Use the up/down arrows to select the bead-up mode and input values.

The bead-up mode can be entered by:

- time (in minutes and seconds)
- displacement (in millimeters)
- bead size per spec (in millimeters) (can not be changed from standard)

IMPORTANT: Entering a value will override the fusion standard parameter for time or displacement modes. Do not enter a value if you want to use the bead-up from the fusion standard parameters.



PH05648-03:22:17

PH05649-03:22:17

PH05650-03:22:17


PH05651-03:22:17

PH05652-03:22:17

Operation - Auto Fusion

Auto Fusion (continued)

Enter any location or project details (optional). These details will be displayed in the joint report.

- Press  to change the location/project details.
- Tap **Yes>>** to proceed with these location/project details.




Prepare for Fusion:

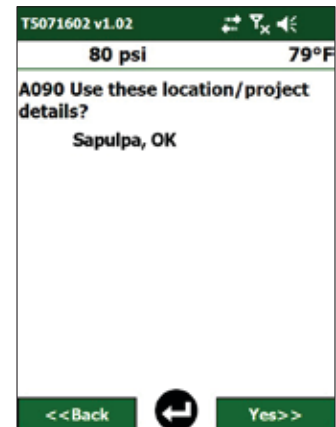
Refer to "Operation - General" section for details on pipe facing and Hi/Lo alignment check.

- Tap **Next>>** when the pipe has been prepared for fusion.

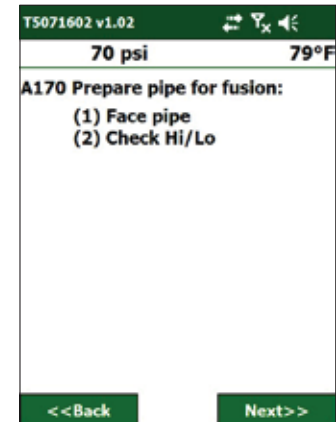
Input any notes about the fusion joint (optional). The notes can be appended after the fusion joint is complete. Tap **Enter>>**.

Take one photo of the pipe (optional) before the fusion.

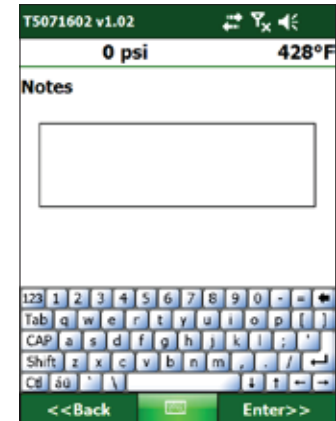
- Tap the zoom icon  to change the zoom of the photo.
- Tap the camera icon  to capture a photo.
- Tap the trash icon  to delete the photo taken.
- Tap **Next>>** to proceed.



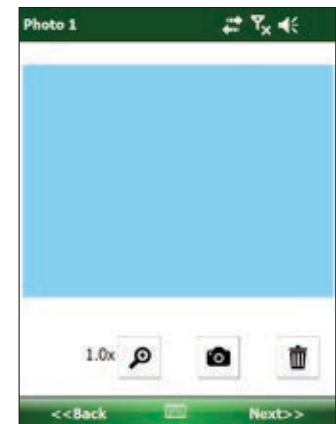
PH05545-04-06-17



PH05545-04-06-17



PH05600-04-06-17



PH05547-06-30-16

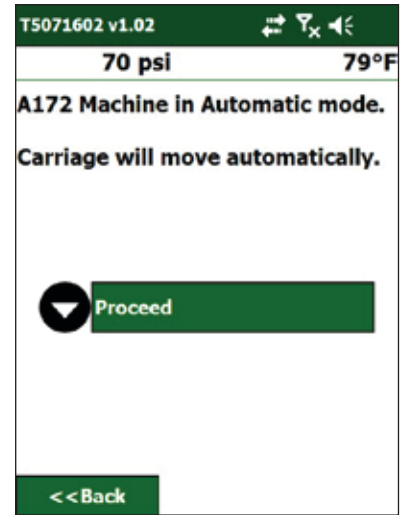
Operation - Auto Fusion

Auto Fusion (continued)

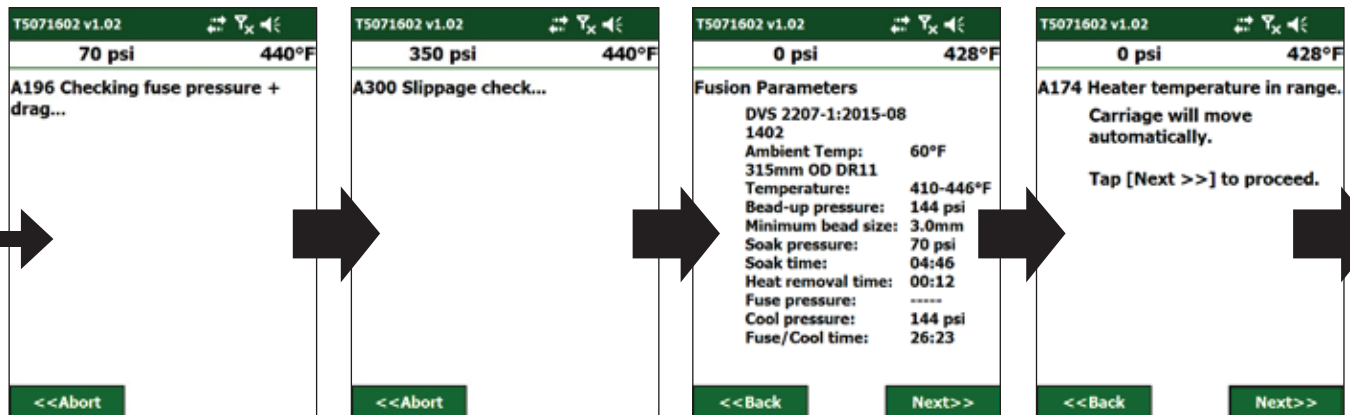
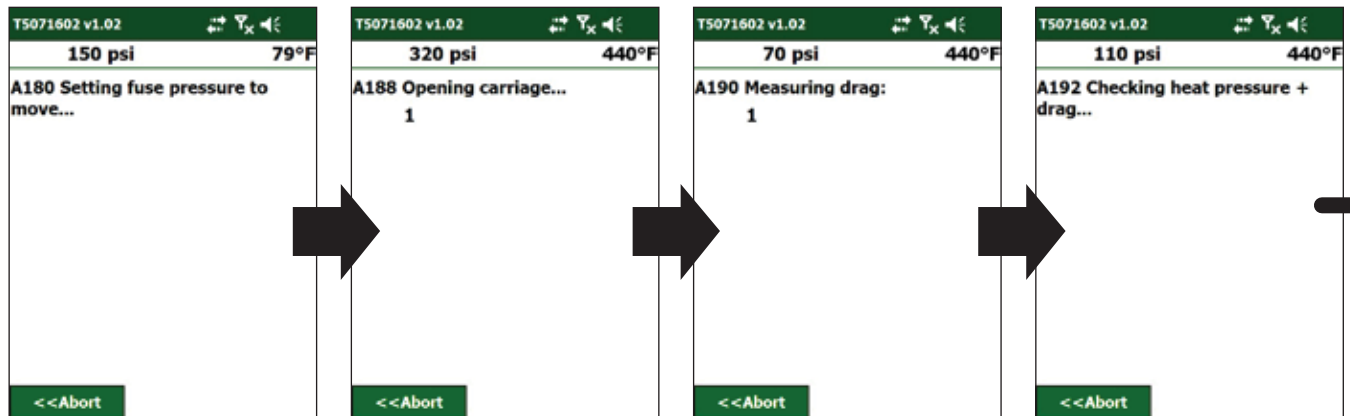
The auto fusion operation will start and proceed through a series of screens. The carriage will move automatically. There will be audible beeping before the carriage moves automatically.

⚠ WARNING Hydraulically operated equipment operates under high pressure and generates extremely high forces. Anything inadvertently caught in the machine will be crushed. Keep fingers, feet, arms, legs, and head out of the machine while operated. Always ensure machine power is off before entering the machine for any reason.

- Tap **Proceed** when ready to begin the auto fusion operation.
- To abort the fusion operation at anytime, tap the Abort button. Manual machine controls will be restored.
- The emergency stop button located on the right side of the fusion control pendant will shut down machine and the fusion operation, disabling all machine functions.



PH05548-04-06-17

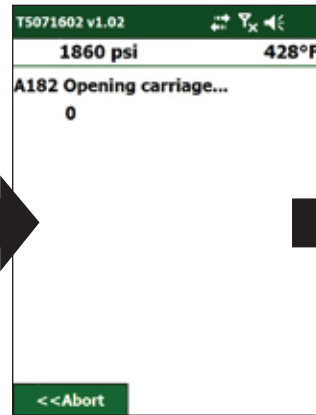
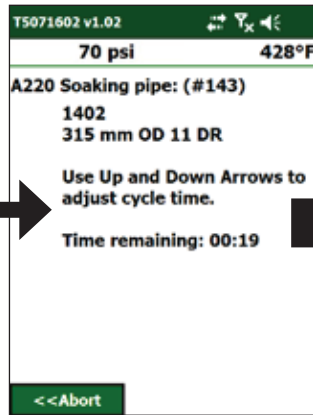
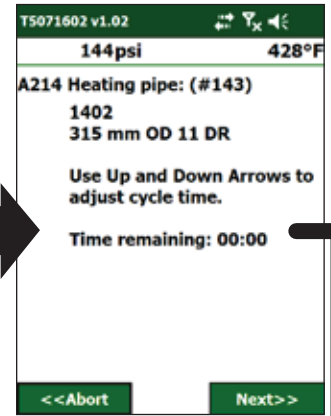
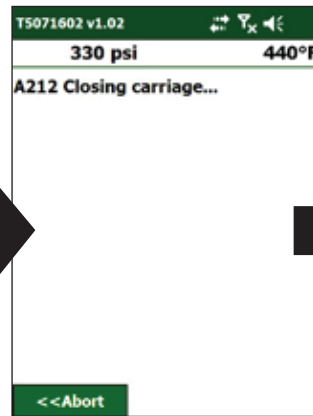
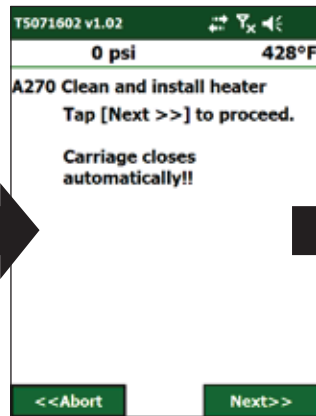
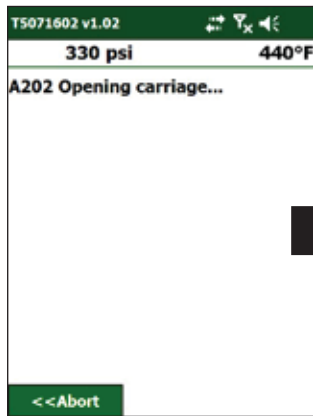


Accept the fusion parameters by tapping **Next>>**. Tap **<<Back** to go back and make any changes to the fusion parameters.

Once the heater is within temperature range, Tap **Next>>** to proceed with the fusion.

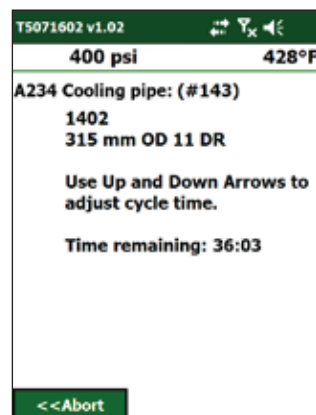
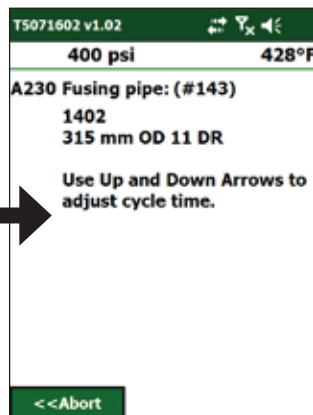
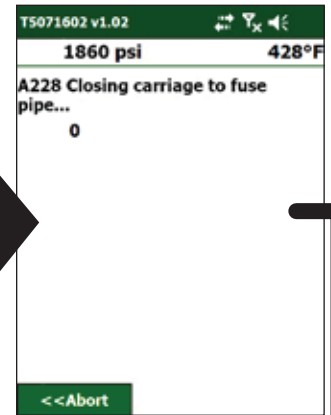
Operation - Auto Fusion

Auto Fusion (continued)



Self retracting heaters will remove automatically during the heater removal process.

Quickly Remove Heater



After the fusion joint, the joint report will appear.

Operation - Auto Fusion

Auto Fusion (continued)

View Joint Report:

The joint report has 4 screens of information about the recorded fusion joint. Use the Next>> and <<Back buttons to scroll between the 4 screens.

The information in the joint report shown here is performed under simulation and may not reflect actual fusion joint information.

- 1 **Location/project details:** - Previously entered information (optional).
- 2 **Date/Time:** - When the fusion joint was made.
- 3 **Joint Number:** - The number given to the recorded fusion joint. As other joints are made, the number will increment to the next number.
- 4 **Job Number:** - Number given to the job the fusion joint was made under.
- 5 **Employee Payroll No.:** - Employee or operator number for personnel performing the fusion joint.
- 6 **Passport/EUSR:** - Number for UK gas reference.
- 7 **McElroy ID:** - ID number given to McElroy qualified operators.
- 8 **Machine ID:** - Identification number for the fusion machine.
- 9 **Machine Model:** - Fusion machine model used to perform the fusion.
- 10 **Piston Area:** - The total effective piston area of the machine.
- 11 **Fusion Spec:** - The specification or standard used to perform the fusion.
- 12 **Pipe Size:** - The size of the pipe that was fused and the material of the pipe that was fused.
- 13 **Joint Status:** - Completed, aborted, failed, dummy.
- 14 **Heater:** - Displays the target temperature from the fusion specification and the actual temperature that was recorded.
- 15 **Heat:** - Displays the target and actual heating pressures and times.
- 16 **Soak:** - Displays the target and actual soak pressures and times.
- 17 **Open/Close:** - Displays the target and actual open/close times.
- 18 **Fuse:** - Displays the target and actual fusing pressures and times.
- 19 **Cool:** - Displays the target and actual cooling pressures and times.
- 20 **Drag Pressure:** - Recorded drag pressure.

Joint Report ↔ 🔍 ⏪

D182 Joint report page 1:

1. Location/project details:
Sapulpa, OK

2. Date/Time: 2016-05-27 10:09:40
3. Joint Number: 7824
4. Job Number: 456
5. Employee Payroll No.: 2144
6. Passport/EUSR: 123
7. McElroy ID:

<<End Next>>

PH05567-06-30-16

Joint Report ↔ 🔍 ⏪

D184 Joint report page 2:

8. Machine ID: U167
9. Machine Model: T900 Series 2
10. Piston Area: 15.32in²
11. Fusion Spec: GAS PE100 / PE80
12. Pipe Size: 36" OD DR 21 PE80
13. Joint Status: Complete

| | Target | Actual |
|-------------|--------------|------------------|
| 14. Heater: | 452 | 450°F |
| 15. Heat: | 335 00:05 | 335 psi 00:05 |

<<Back Next>>

PH05568-06-30-16

Joint Report ↔ 🔍 ⏪

D186 Joint report page 3:


| | | |
|--------------------|----------------|------------------|
| 16. Soak: | 70 07:08 | 70 psi 00:20 |
| 17. Open/Close: | 00:17 | 00:01 |
| 18. Fuse: | ----- 00:00 | ----- 00:00 |
| 19. Cool: | 326 51:45 | 326 psi 00:20 |
| 20. Drag Pressure: | | 70 psi |

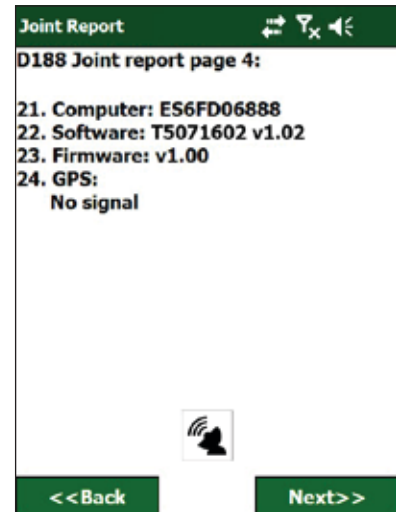
<<Back Next>>

PH05607-06-30-16

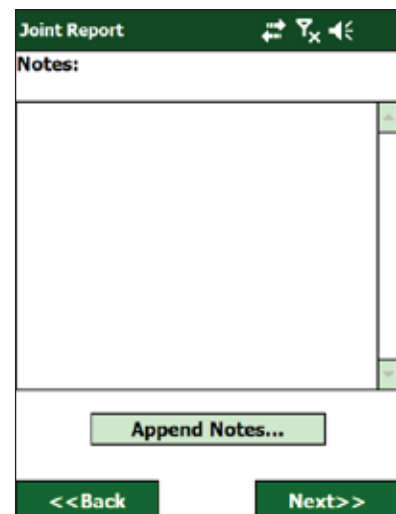
Operation - Auto Fusion

Auto Fusion (continued)

- 21 **Computer:** - The handheld computer serial number.
- 22 **Software:** - The software version number.
- 23 **Firmware:** - The Fusion Control Pendant firmware number.
- 24 **GPS:** - The GPS coordinates recorded for the fusion joint. Tap the GPS icon  to acquire GPS coordinates if none have been recorded.






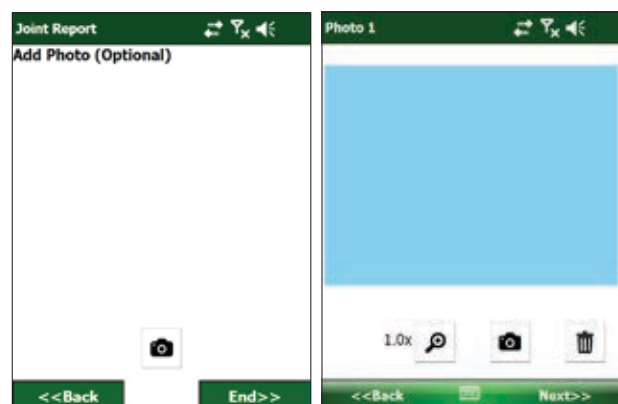
- Append the previously entered notes with any additional information about the fusion joint.



Add Photo: - Add an optional photo of the fusion joint to the joint report.

Take one photo of the pipe (optional) after the fusion.

- Tap the zoom icon  1.0x to change the zoom of the photo.
- Tap the camera icon  to capture a photo.
- Tap the trash icon  to delete the photo taken.
- Tap **Next>>** to proceed.



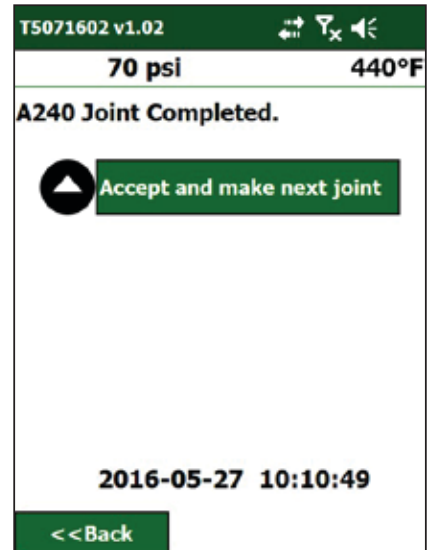
Operation - Auto Fusion

Auto Fusion (continued)

After the entering notes and a photo, the joint report is sent to the DataLogger® Vault™ if a Vault account is logged into and a data connection is available. If not, the joint report is saved on the handheld computer for transfer at a later time. The joint completed menu appears.

- **Accept and make next joint** - Accept the fusion joint and proceed to next joint.

TX05270-04-06-17



PH05662-03-27-17

Operation - Auto Fusion

Auto Fusion (continued)

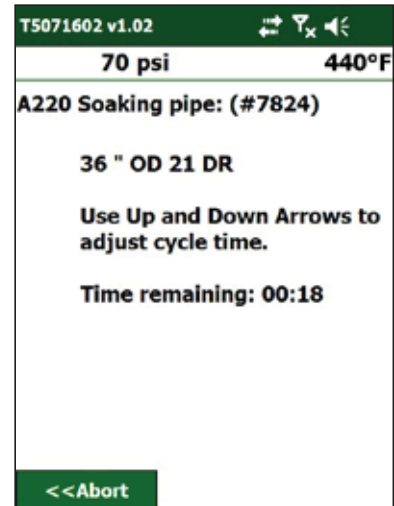
Create Dummy Joint (Optional):

A Dummy Joint can be made by following the normal facing, heating, and soaking procedures. Any time during the soak cycle, you may tap <<Abort to interrupt the cycle. The automatic cycle will stop, and you are given a choice to abort the joint or record a Dummy Joint report.

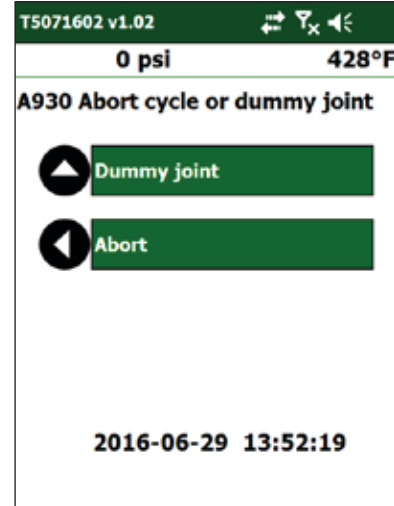
- Tap **Dummy Joint** to continue the automatic fusion operation performing a dummy joint.
- Tap **Abort** to stop the automatic fusion operation.

When the dummy joint is complete, the joint report is recorded.

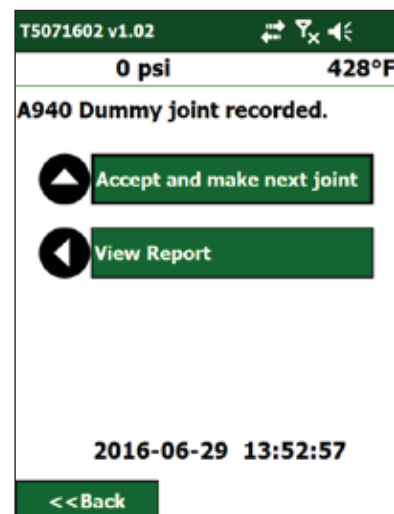
- **Accept and make next joint** - Accept the recorded joint and proceed to next joint.
- **View Report** - View the recorded joint report. The joint status in the report will list a status of Dummy Joint.



PH05662-04-06-17



PH05604-04-06-17



PH05603-04-06-14

Operation - Auto Fusion

Opening Jaws

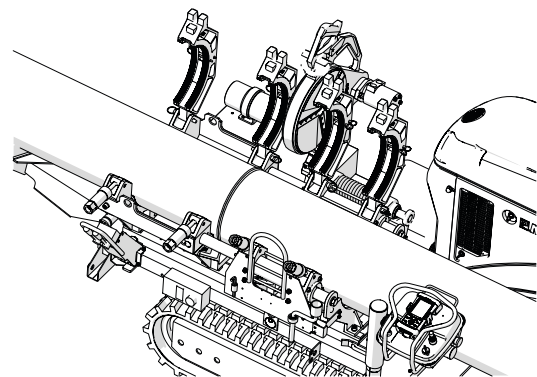
After the fusion process is complete, ensure the carriage directional control to the neutral position.

Loosen all clamp knobs, and move carriage to the right far enough to open the jaw nearest the facer.

Self Retracting Heater: Facer will be positioned between the movable jaws.

Open the jaws.

TX05357-04-09-18



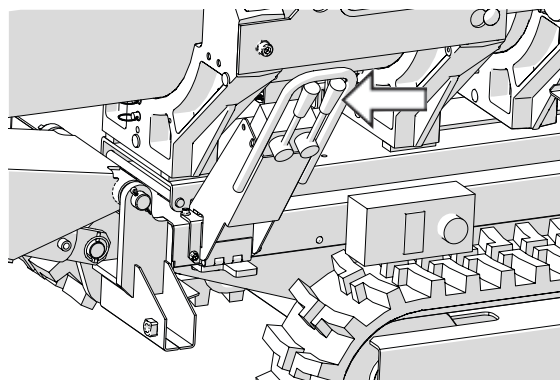
CD01869-11-29-16

Raise Pipe

Raise the fused pipe above the lower jaws using the machine's hydraulic pipe lifts.

NOTICE: Ensure pipe is raised high enough to clear the bead prior to pulling fused pipe through the jaws.

TX01681-04-18-16



CD01865-12-05-16

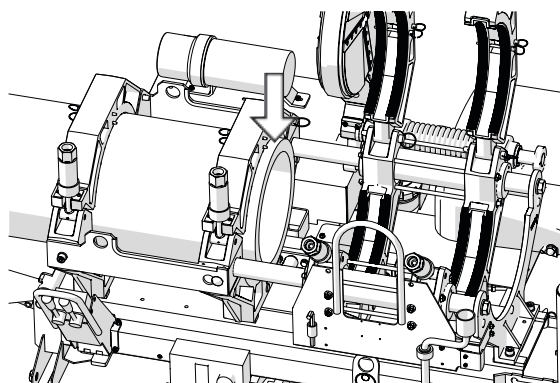
Position Pipe for Next Joint

Position pipe with enough material protruding past the inner fixed jaw face to allow for complete facing of the pipe end.

If you choose to drive to the pipe, ensure the area around the vehicle is clear of personnel and obstructions.

WARNING Ensure there are no personnel near the vehicle when driving. Failure to do so could result in serious injury or death to personnel.

TX04917-04-18-16



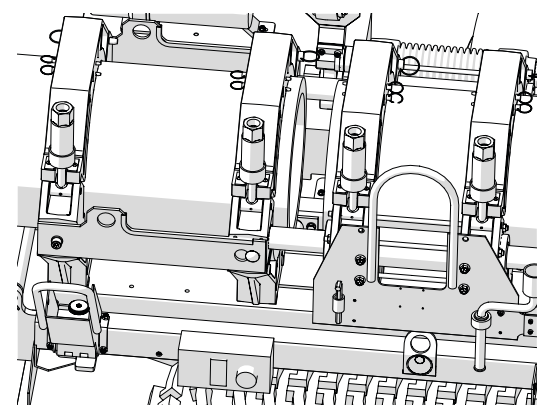
CD01870-11-29-16

Install Next Piece of Pipe

Install a new piece of pipe in movable jaws, and position pipe with enough material protruding past the inner movable jaw face to allow for complete facing of the pipe end.

Repeat all previous steps after "Loading Pipe into Machine" section.

TX00384-04-18-16



CD01864-11-17-16

Operation - Auto Fusion

Auto Report Menu

- **View Report:** - Opens the lists of joint reports that are not sent and sent to the DataLogger® Vault™.
- **Send Reports:** - Sends any joints not sent to the DataLogger® Vault™. Requires a data connection.
- **DataLogger® Vault™ Account:** - Provides access to login screen (System password required).

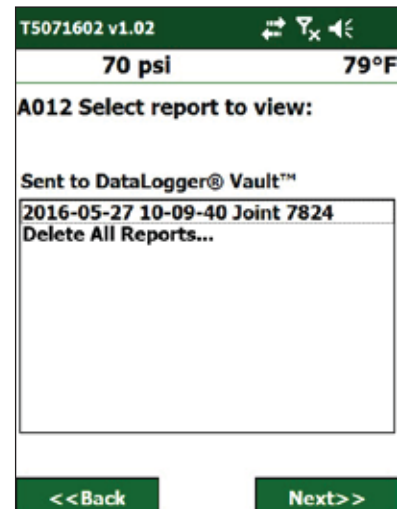
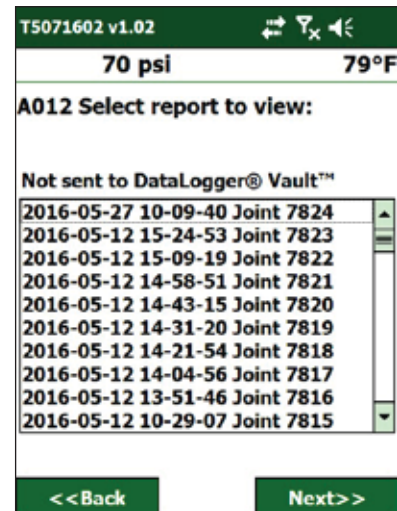
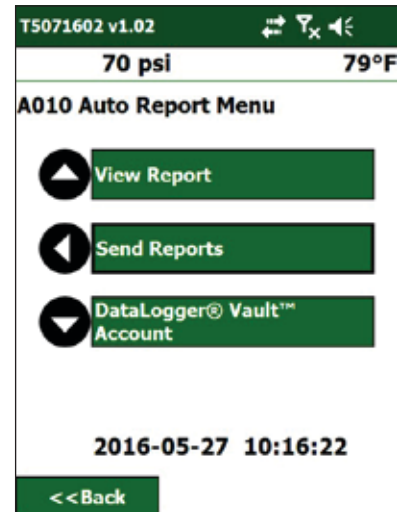
View Report

The first screen shows joint reports not sent to DataLogger Vault. Tap a report to view. These reports will be sent to DataLogger Vault if "Send Reports" is selected on previous "Auto Report Menu" screen and a data connection is present.

- Tap **Next>>** to view reports sent.

Select a joint report to view. The reports in this list have been sent to the DataLogger Vault.

- Tap **Next>>** to return to the Auto Report Menu.
- Tap **Delete All Reports...** to delete all sent joint reports.

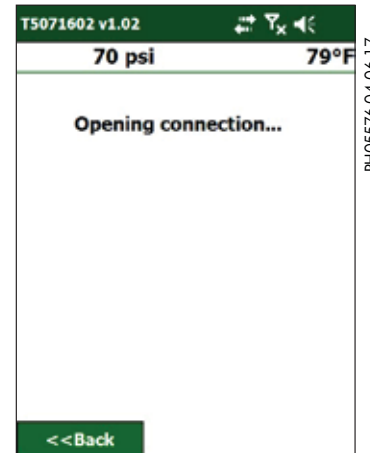


Operation - Auto Fusion

Auto Report Menu (continued)

Send Reports

The handheld computer will attempt to establish a connection with the DataLogger Vault. It is required that the computer has a data connection and the operator is logged into a DataLogger Vault account.



DataLogger® Vault™ Account

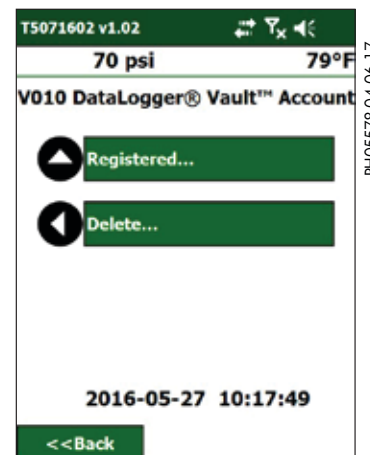
Selecting DataLogger Vault Account displays a screen with two options:

- **Registered...** - Displays a log in screen with user name and password fields. Log in using a registered account.

If you do not have a registered account, go to vault.mcelroy.com to create a new account.

- **Delete...** - Logs out of the DataLogger Vault and deletes the personal information attached to the registered account from the handheld computer.

A different registered account can now be used by going to Registered and entering a user name and password of a different registered account.



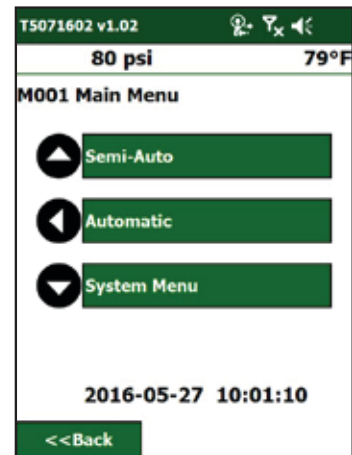
Operation - Semi-Auto Fusion

Semi-Auto Fusion

Semi Auto fusion allows the operator to perform all fusion operations to make a manual fusion using the Fusion Control Pendant.

- Tap Semi-Auto to manually set the fusion operation pressures.

IMPORTANT: The Operation - General section must be completed before starting a semi-auto fusion.



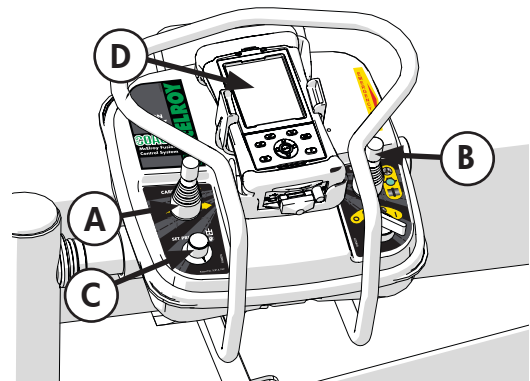
PH0551706-06-16

TX05070-07-07-16

Determine Drag Pressure

Determine drag pressure using the following steps:

- 1) Move the carriage so that the faced pipe ends are approximately 2" (50mm) apart.
- 2) Shift **(A)** to the middle (neutral) position.
- 3) Shift **(B)** to the middle heating position, and adjust **(C)** to its lowest pressure by turning the knob counterclockwise.
- 4) Shift **(A)** to the left.
- 5) Gradually increase the pressure by turning **(C)** clockwise slowly. Increase the pressure until the carriage just begins to move.
- 6) Quickly reduce pressure by turning **(C)** counterclockwise until the carriage is just barely moving.
- 7) View pressure on the handheld computer **(D)**. Record this actual drag pressure.



- A - Carriage Directional Control
- B - Pressure Selector Control
- C - Carriage Pressure Adjustment Knob
- D - Handheld Computer

CD01859-11-16-16

TX05071-07-07-16

Set Pressures

Use the pressure selector control on the Fusion Control Pendant to select between facing, heating, and fusing pressures.

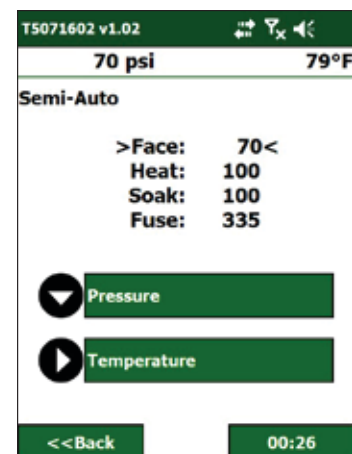
The theoretical fusion pressure can be determined using the fusion pressure calculator that is supplied with the machine or by using the McCalc® app is available for iOS, Android, Windows Phone and PC devices. The fusion pressure can also be determined by referring to the section Determining Fusion Pressure.

Always add drag pressure to the theoretical fusion pressure.

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

To make pressure adjustments for each selection, choose either of these options:

- On the Fusion Control Pendant, turn the carriage pressure adjustment knob to the desired pressure setting.
- On the Pendant Handheld Computer, tap the Pressure button and input the desired pressure setting.



PH05669-04-13-17

TX05072-04-06-17

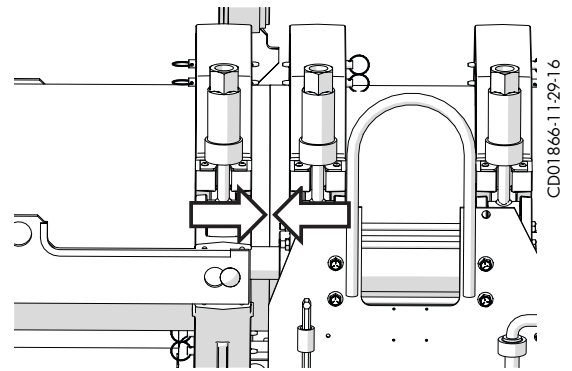
Operation - Semi-Auto Fusion

Check for Slippage

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

If slippage occurs, return to **Loading Pipe into Machine**.

TX00971-04-18-16



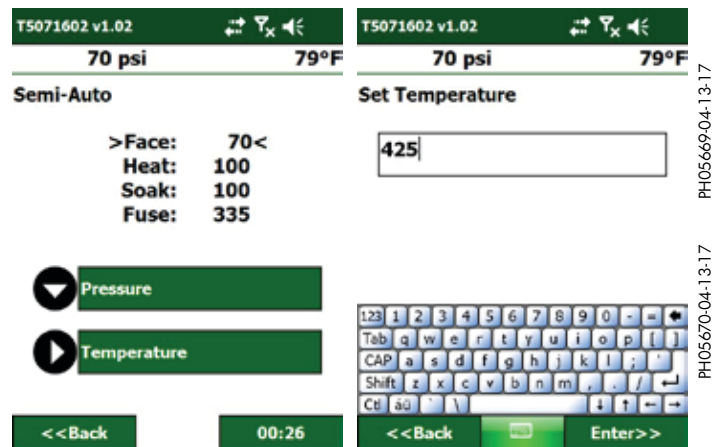
Set Temperature

Tap the Temperature button and input the desired temperature setting. Allow several minutes for the heater to reach the set temperature.

Check the surface temperature of the heater with a pyrometer.

Compare the surface temperature with the displayed temperature on the handheld computer. Enter the difference in the System Menu > Check Heater Offset.

TX05293-04-13-17



Inserting Heater

Open the carriage completely.

Self Retracting Heater: Do not open carriage completely. Open carriage wide enough to insert the heater between the pipe ends.

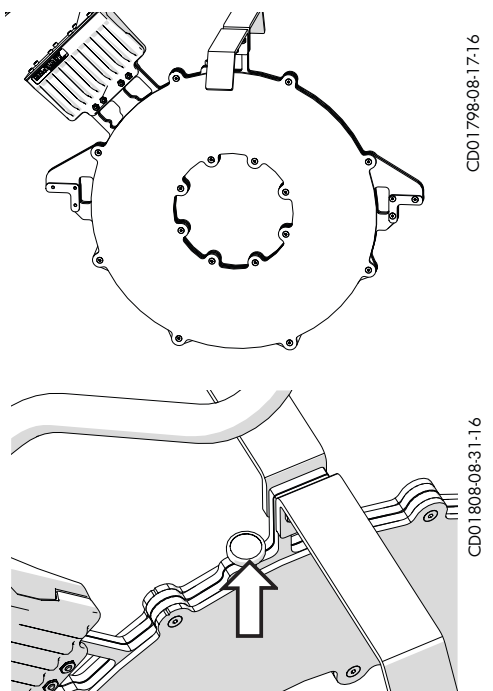
⚠ DANGER Heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

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

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

Insert heater between the pipe ends.

TX05358-04-09-18



Operation - Semi-Auto Fusion

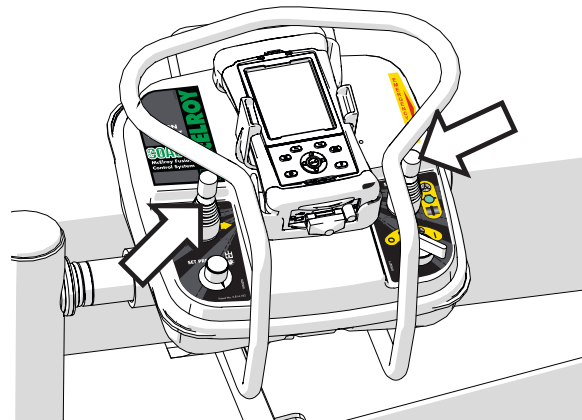
Heat Pipe

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

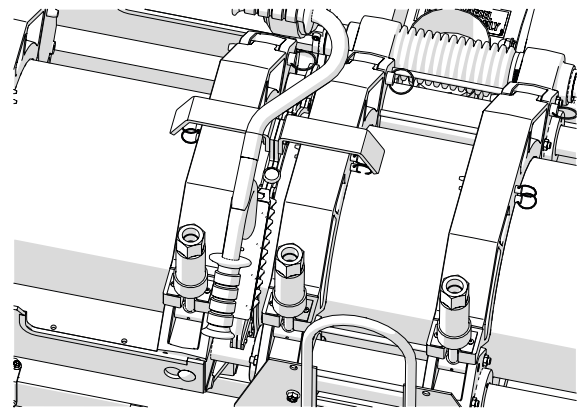
IMPORTANT: A modified shift sequence may be required in certain situations.

Shift the pressure selector control to the fusing position and move carriage to the left to bring pipe ends in contact with the heater. Ensure proper initial bead-up, move pressure selector control to middle (heating) position. If heating 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 directional control to neutral after the carriage pressure drops to drag pressure.

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



CD01859-11-16-16



CD01868-11-29-16

TX05076-07-07-16

Fusing the Pipe

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

After following the heating procedure, verify carriage directional control is in neutral and move pressure selector control down to fusing position.

Open the carriage just enough to remove the heater.

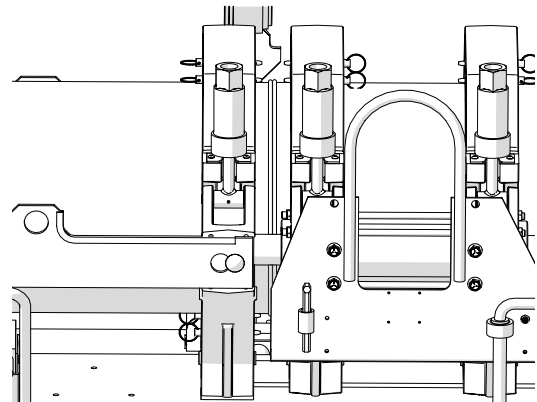
Self Retracting Heater: Open the carriage completely so that the heater retracts.

Quickly remove the heater.

Quickly inspect pipe ends for appropriate melt.

When heater is clear of the jaws, quickly close the carriage to bring the pipe ends together. Ensure the appropriate maximum open/close time is not exceeded.

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



CD01867-11-29-16

TX05359-04-09-18

Operation - Semi-Auto Fusion

Opening Jaws

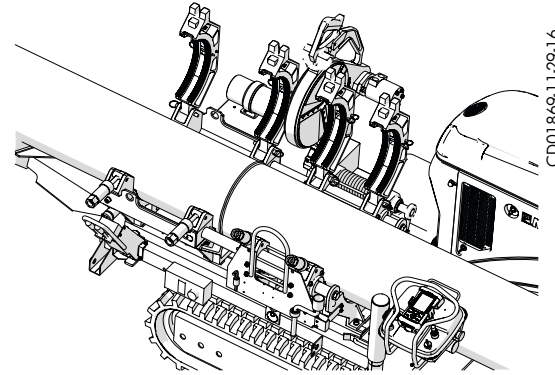
After the fusion process is complete, Shift the carriage directional control to the neutral position.

Loosen all clamp knobs, and move carriage to the right far enough to open the jaw nearest the facer.

Self Retracting Heater: Facer will be positioned between the movable jaws.

Open the jaws.

TX05357-04-09-18



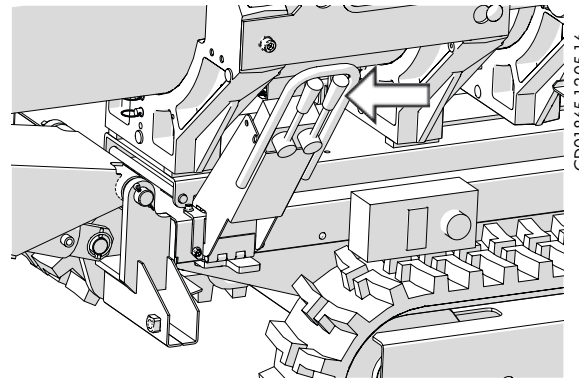
CD01869-11-29-16

Raise Pipe

Raise the fused pipe above the lower jaws using the machine's hydraulic pipe lifts.

NOTICE: Ensure pipe is raised high enough to clear the bead prior to pulling fused pipe through the jaws.

TX01681-04-18-16



CD01865-12-05-16

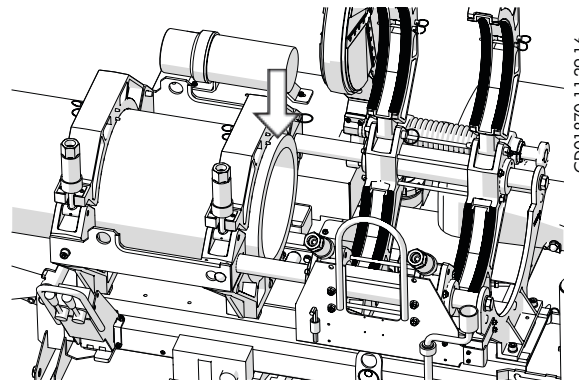
Position Pipe for Next Joint

Position pipe with enough material protruding past the inner fixed jaw face to allow for complete facing of the pipe end.

If you choose to drive to the pipe, ensure the area around the vehicle is clear of personnel and obstructions.

WARNING Ensure there are no personnel near the vehicle when driving. Failure to do so could result in serious injury or death to personnel.

TX04917-04-18-16



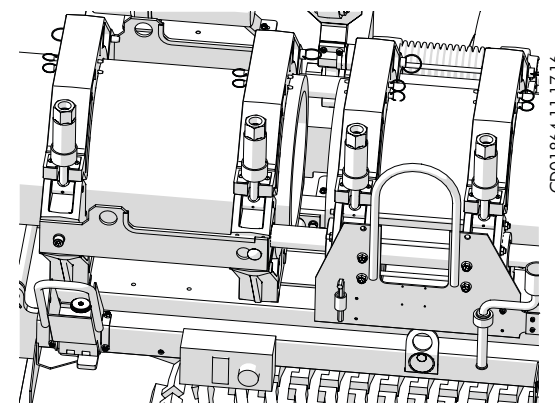
CD01870-11-29-16

Install Next Piece of Pipe

Install a new piece of pipe in movable jaws, and position pipe with enough material protruding past the inner movable jaw face to allow for complete facing of the pipe end.

Repeat all previous steps after "Loading Pipe into Machine" section.

TX00384-04-18-16



CD01864-11-17-16

System Menu

Fusion Control System Menu

The fusion machine is equipped with The Coach® Fusion Control System on the McElroy® fusion pendant. The fusion control software settings can be changed through the system menu.

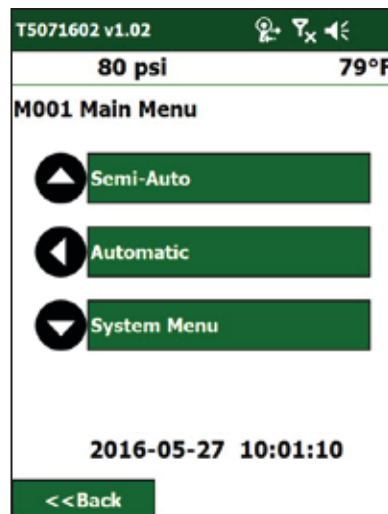
Tap **System Menu** to make changes to the fusion control software.

The system password is required to access the system menu. Input the system password and tap Enter>> to continue.

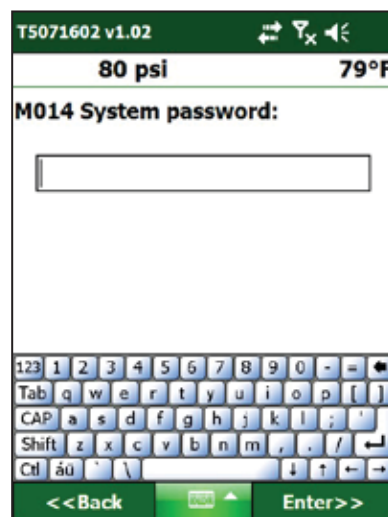
The default system password is **123**.

System Menu (1):

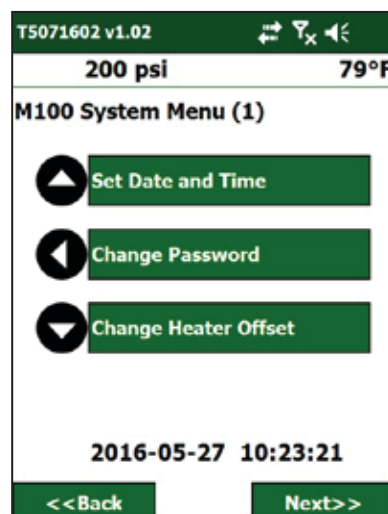
- **Set Date and Time** - Change the date and time for the computer.
- **Change Password** - Change the password, the current password is needed to make a change.
- **Change Heater Offset** - Adjust the heater temperature offset.



PH05517-04-06-17



PH05523-04-06-17



PH05518-04-06-17

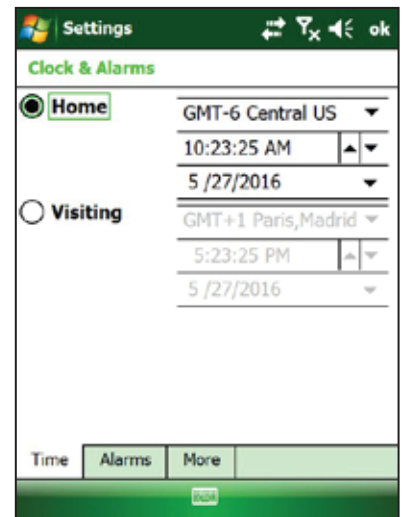
System Menu

System Menu (1)

Set Date and Time:

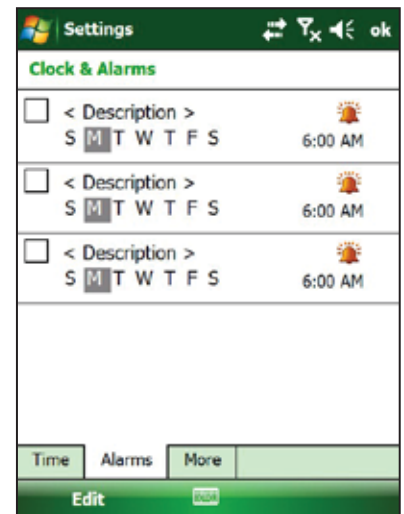
There are two clock locations, home and visiting.

Set the time zone, time, and date for home time to use with the machine.



Select the alarms tab at the bottom of the screen to tab to the alarm settings.

The operator can set 3 different alarms. Set the different days of the week and the time the alarm is to sound.

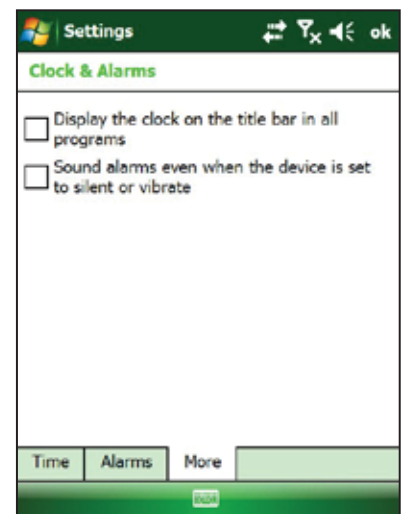


Select the More tab at the bottom of the screen to tab to the additional settings.

Check the first option to display the clock on the title bar in all programs.

Check the second option to sound alarms even when the device is set to silent or vibrate.

Tap "ok" at the top right to continue.



System Menu

System Menu (1) (continued)

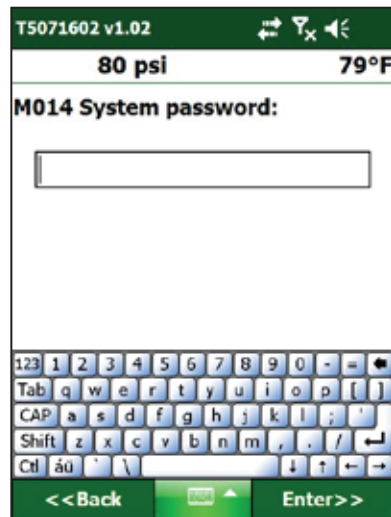
Change Password:

To change the password:

Input the current system password.

The default system password is **123**.

Tap **Enter>>**.



PH05523-04-06-17

Input the new system password.

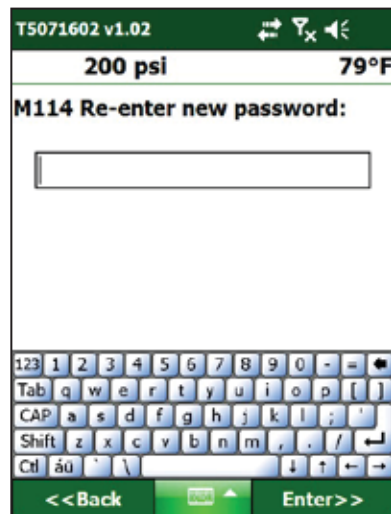
Tap **Enter>>**.



PH0552704-06-17

Re-input the new system password.

Tap **Enter>>**.



PH05528-04-06-17

System Menu

System Menu (1) (continued)

Change Heater Offset:

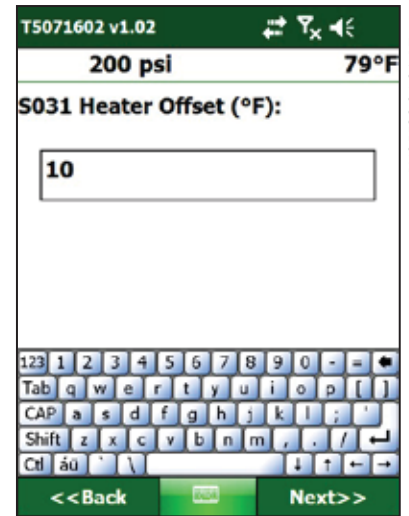
Input the measured offset value in degrees:

If the measured surface temperature differs from the temperature display on the handheld computer, enter the difference between the measured surface temperature and the displayed temperature on the handheld computer by adding the difference to the previously entered heater offset. Let the heater cycle 3 times and recheck the surface temperature and compare to the displayed temperature.

IMPORTANT: Ensure the degree units (°F or °C) of the measured offset value matches the units on the handheld computers.

Tap **Next>>**.

TX05079-04-06-17



PH05529-04-06-17

System Menu (2)

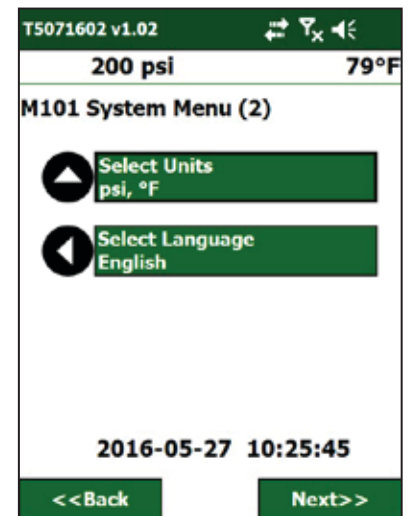
Select Units:

Tap to change the units between (PSI, °F) and (bar, °C).

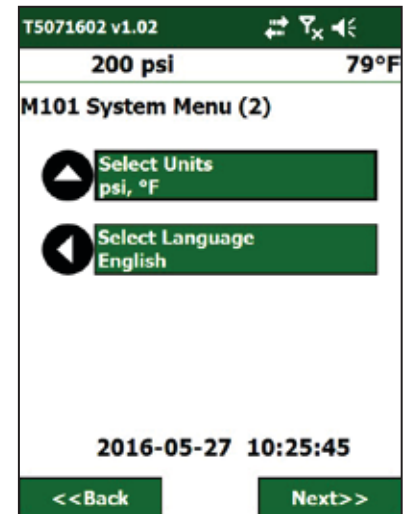
Select Language:

Tap to change the language. Available languages are English, Spanish, Portuguese, French, Russian, Chinese.

TX05080-06-28-16



PH05519-04-06-17

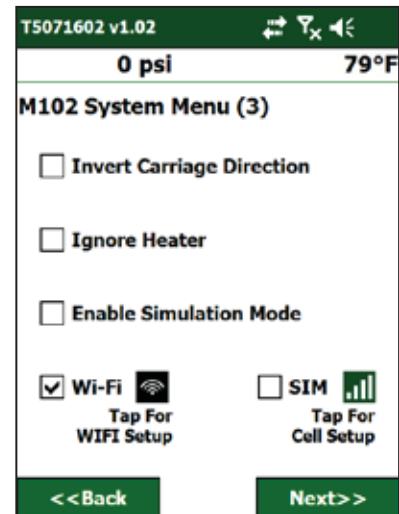


PH05519-04-06-17

System Menu




System Menu (3)

- Tap **Invert Carriage Direction** to invert the direction of movement of the carriage control.
- Tap **Ignore Heater** to ignore the heater reaching fusion temperature to allow the operator to proceed through the fusion processes that are dependent on heater temperature.
- Tap **Wi-Fi** to enable/disable Wi-Fi communications. A Wi-Fi data connection is required.
- Tap **SIM** to enable/disable data connectivity using a SIM card. A cellular carrier SIM card must be installed in the handheld computer. Refer to the Maintenance section of this manual for instruction on installing a SIM card. The Trimble® Nomad handheld computer uses GPRS, Edge, or 2.5G SIM cards.














PH05524-06-06-16

Wi-Fi connection icons:

-  No connectivity
-  Establishing connection to Wi-Fi
-  Connected

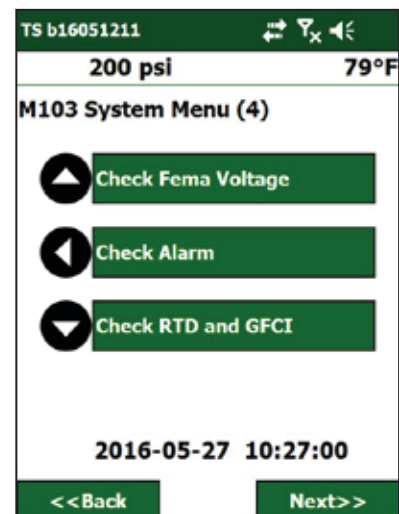
SIM connection icons:

-  Identifying SIM card
-  Searching for cell network
-  Connected (shows signal strength)
-  Data is turned off
-  No signal
-  No service. Data connection unavailable or network error
-  EDGE available
-  EDGE connected
-  GPRS available
-  GPRS connected
-  No SIM card installed or mounted properly

TX05081-06-28-16

System Menu (4)

- **Check FEMA Voltage** - Temporarily change the FEMA pressure valve voltage for testing and troubleshooting purposes.
- **Check Alarm** - Sounds the alarm as a test of its function.
- **Check RTD and GFCI** - Check the values for the RTDs and the GFCI error count.



PH05525-06-06-16

System Menu

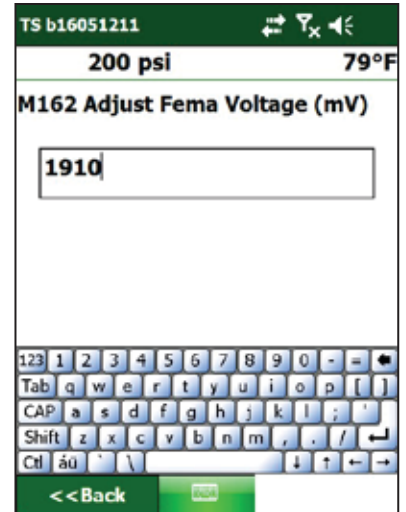
System Menu (4) (continued)

Check Fema Voltage:

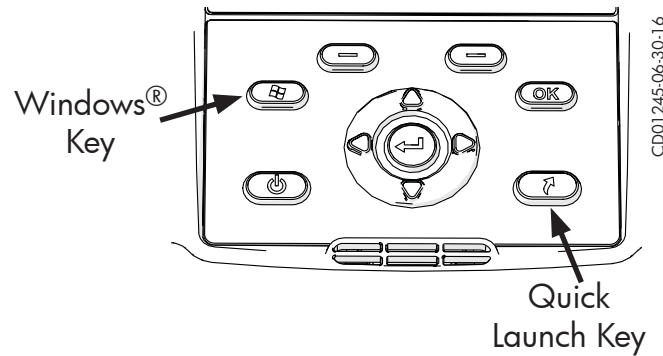
The FEMA pressure valve voltage can be temporarily changed for testing and troubleshooting purposes. The voltage is entered in millivolts (mV). Setting the voltage will show a response in the hydraulic pressure. Enter a value between 1000mV to 10,000mV.

Press the Windows® and Quick Launch Key together to open the diagnostic screen. The entered voltage is shown and the pressure can be viewed to compare the response.

The entered voltage is temporary and will revert back to normal value when exiting from this screen.



PH05531-06-06-16



CD01245-06-30-16

Check Alarm:

Sounds the alarm to check if it is functioning properly.

System Menu

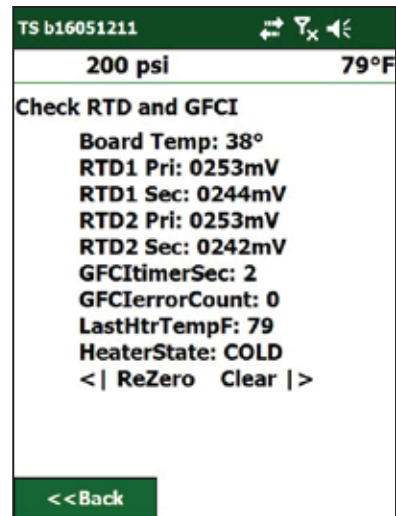
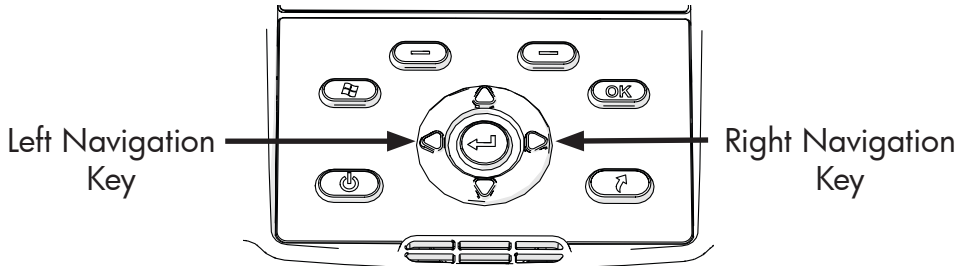
System Menu (4) (continued)

Check RTD and GFCI:

Check values for the RTDs and GFCI.

Press **Left navigation key** to rezero/calibrate the RTDs

Press **Right navigation key** to clear the GFCI error count.



TX05082-06-28-16

PH0553206-06-16
CD01245-06-30-16

System Menu (5)

Update Software:

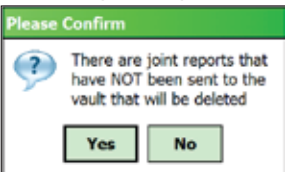
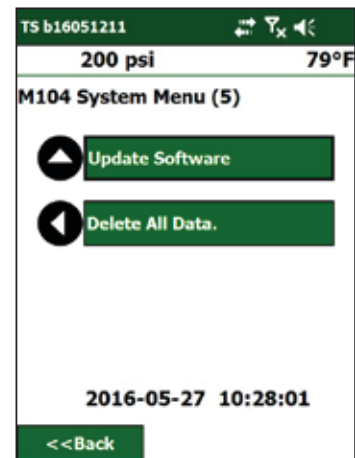
Updates the software if there is a newer version available (a data connection is required to update). The update will be downloaded and installed automatically.

IMPORTANT: A WIFI data connection is recommended for downloading updates.

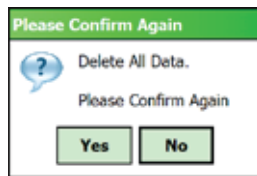
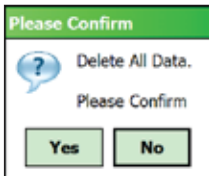
Delete All Data.:

Deletes all joint reports and user data from the handheld computer.

If you have any joint reports not sent, you will be asked if you want to delete them. If there are no joint reports not sent, this dialog box will be skipped.



You will be asked to confirm the deletion of all data. Confirm **Yes** or **No**. Then you will be asked to confirm one more time.



A different registered account can now be used by going to Registered and entering a user name and password of a different registered account.

TX05292-04-12-17

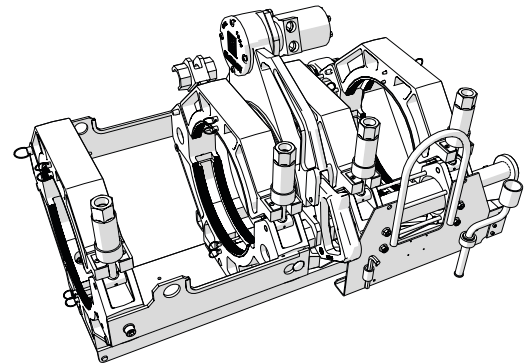
PH0553306-06-16

Special Operations

Special Operations Overview

The carriage may be used off the vehicle for in-ditch tie-ins and fusing tees or fittings that require more working space than is possible while the carriage is mounted on the vehicle.

All off vehicle operations require the extension kit which includes extension cables and hoses.



CD01872:1:30:16

The Special Operations section is divided into:

- 4-Jaw Carriage Removal - Includes the complete 4-Jaw carriage. The facer can be used attached on the pivot arm or disconnected and top loaded.
Self retracting heater and facer can be used attached to the carriage. Instructions for converting the self retracting heater to top loading heater is included in this section.
- Outer Fixed Jaw Removal - Includes the 4-Jaw skid and allows more area to fuse tees or perform tie-ins easier. The facer can be used attached on the pivot arm or disconnected and top loaded.
Self retracting heater and facer can be used attached to the carriage.
- 3-Jaw Carriage Removal - For more compact off vehicle fusion operation. The 3-Jaw carriage assembly (2 moveable jaws and inner fixed jaw) can be removed as a separate unit from the 4-Jaw carriage skid. The facer can be used attached on the pivot arm or disconnected and top loaded.
Self retracting heater and facer must be converted to top loading.
- Top Loading Facer The facer can be removed from the pivot arm and top loaded into the carriage.
- Remove Upper Jaws - For maneuvering the carriage around pipe in tight working spaces.
- Make Fusion Joint Attach carriage to pipe and make a fusion joint.

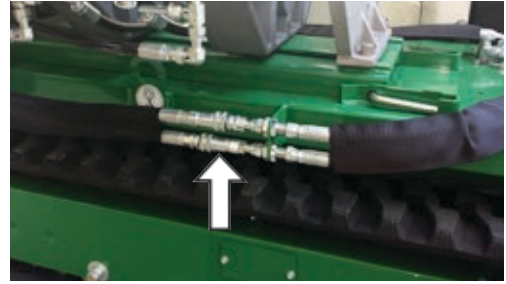
Special Operations

4-Jaw Carriage Removal

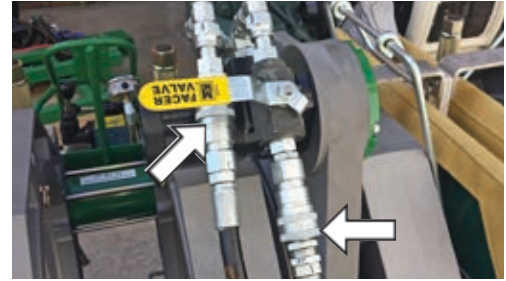
There are two sets of hydraulic hoses. One set connects to the carriage hoses on the machine and to the carriage. The other set connects to the facer hoses on the machine and to the facer.

Disconnect both sets of hoses and transducer cable.

IMPORTANT: Machines with hydraulic clamping will have an extra set of hoses at the carriage location.



PH05639-09-06-16



PH05640-09-06-16

⚠ DANGER

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

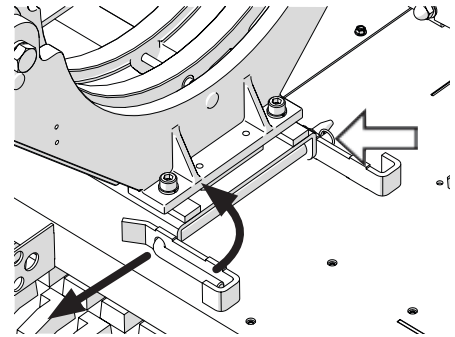
⚠ CAUTION

The machine components are heavy. Using one person to lift the facer or carriage may result in an injury. Use a lifting strap and an overhead lifting device to lift facer or carriage. For manual lifting, two people are required to lift the facer or carriage.

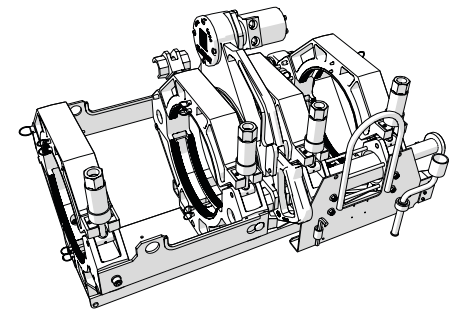
To remove the carriage, pull the pin at the rear of the machine and slide the carriage forward approximately one inch.

Attach lifting sling to the manifold bracket and the far side lift point on the fixed jaw brace then lift the carriage assembly.

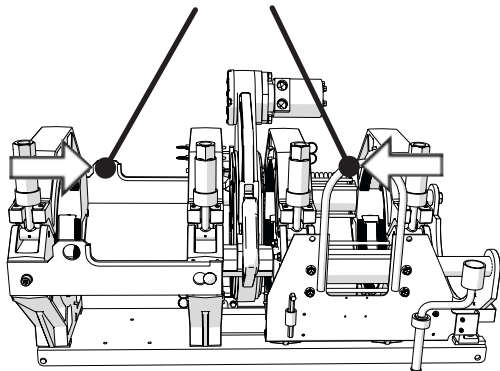
Self Retracting Heater: Attach lifting sling to the right upright and both lift points on the fixed jaw braces then lift the carriage assembly.



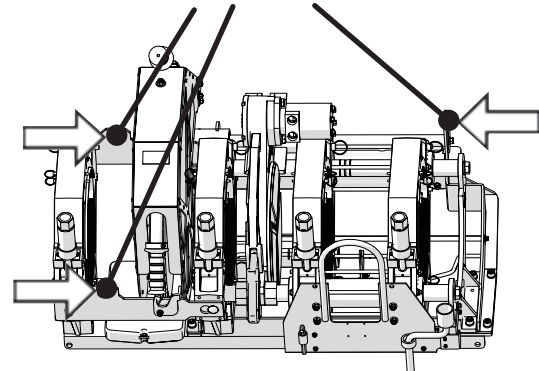
CD01814-09-06-16



CD01872-11-30-16



CD01873-11-30-16



CD02202-04-05-18

Self Retracting Heater

Special Operations

4-Jaw Carriage Removal (continued)

The outrigger is an arm that is retractable and adds support to the carriage assembly when opening the jaws and pivoting the facer away from the carriage.

To extend or retract the outrigger, press the locking button near the base of the outrigger and push or pull the arm until the button snaps to the locked position.

NOTICE: Never use the outrigger to lift or move the carriage.

Connect the extension cable to the control pendant and to the existing cable on the pendant arm.

Convert Self Retracting Heater to Top Loading:

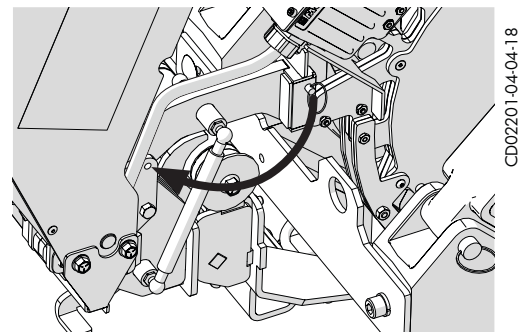
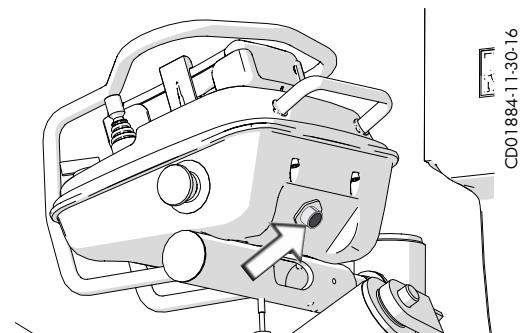
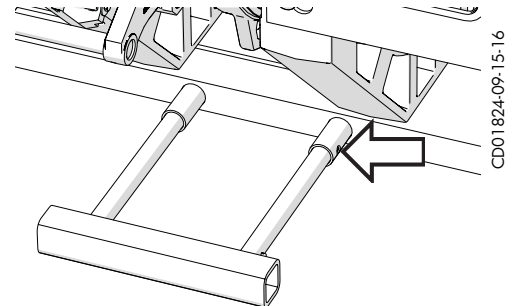
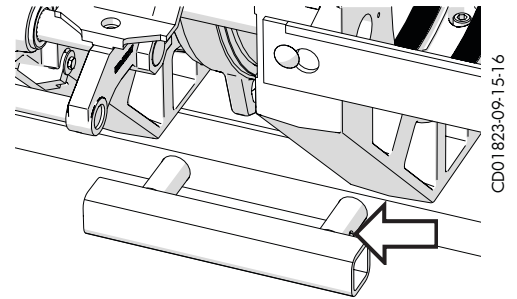
Allow the heater to cool if it is hot.

Place the heater into the storage position between the fixed jaws of the carriage.

Remove the pin at the rear of the heater and place it in the hole at the rear of the heater arm.

To free the heater cable from the cable clamp, insert a small flat tip screwdriver in the larger slot on the clamp and pry away from the cable while lifting up on the top half of the clamp.

Attach stripper bar kit A1242107 to the heater for top loading use.



Special Operations

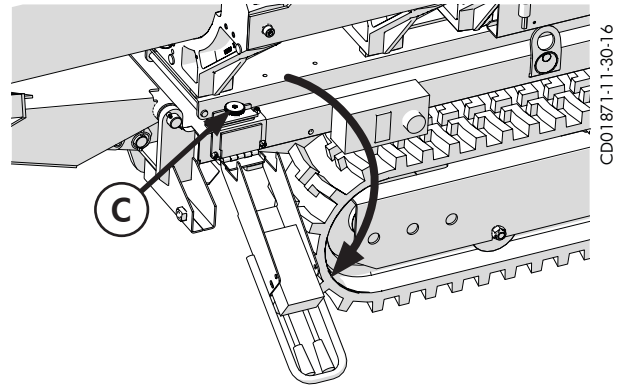
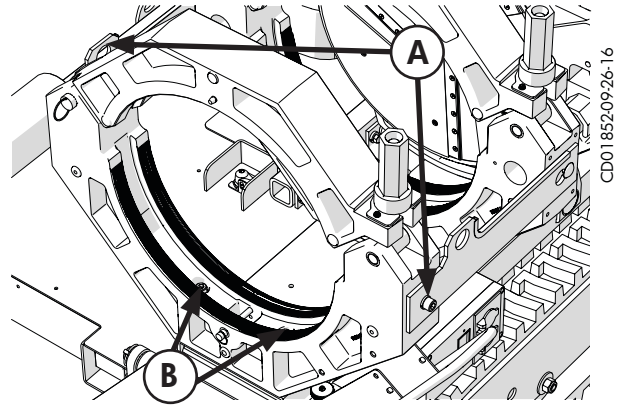
Outer Fixed Jaw Removal

The outer fixed jaw can be removed to allow more room to fuse tees or perform tie-ins.

Remove both fixed jaw braces (A).

Loosen 2 bolts (B) on the jaw and remove the jaw.

The pipe lift control bracket (C) can be loosened and rotated down from the vehicle to allow clearance to fuse without the outer fixed jaw on the machine.



Special Operations

3-Jaw Carriage Removal

Carriage Removal

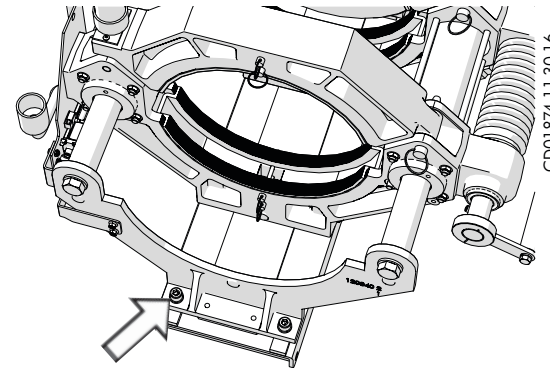
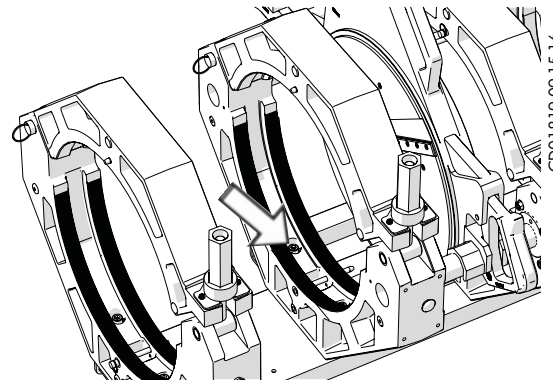
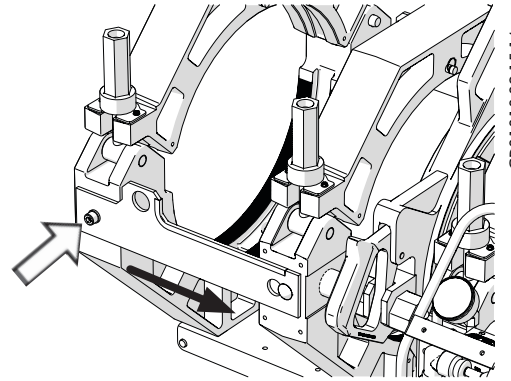
There are two sets of hydraulic hoses. One set connects to the carriage hoses on the machine and to the carriage. The other set connects to the facer hoses on the machine and to the facer.

Disconnect both sets of hoses.

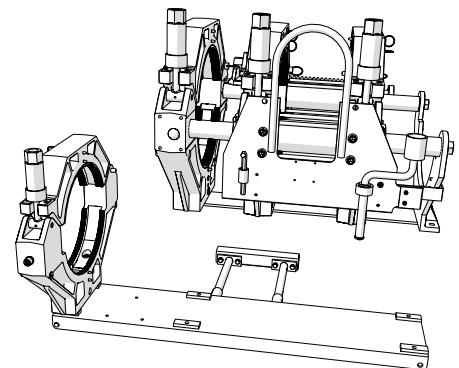
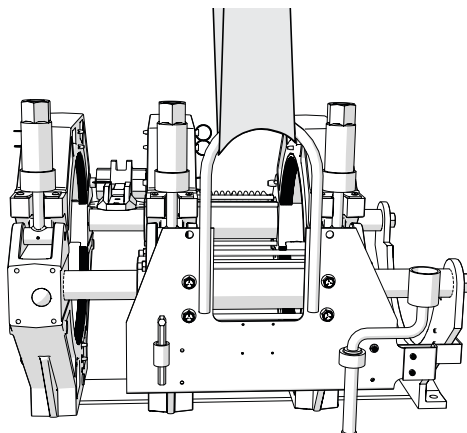
IMPORTANT: Machines with hydraulic clamping will have an extra set of hoses at the carriage location.

Remove braces from inner fixed jaw.

Remove the four bolts holding the carriage assembly to the skid with the wrench provided.



Attach lifting strap as shown and lift the carriage assembly.

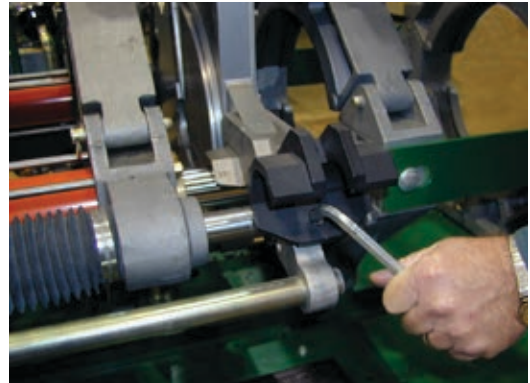


Special Operations

Top Loading Facer

TracStar® 412 and 618 Facer Removal

Remove rear guide rod bracket.



PH01933-11-15-00

Support the facer with a person or sling so it does not fall once the facer locking bolts are removed.

Remove facer locking bolts.



PH01907-11-15-00

Lift facer out of the carriage and set on cardboard or wood blocks off of ground.

Attach rear guide rod bracket in the position shown.



PH01936-11-15-00

Special Operations

Top Loading Facer (continued)

TracStar® 28 and 250 Facer Removal

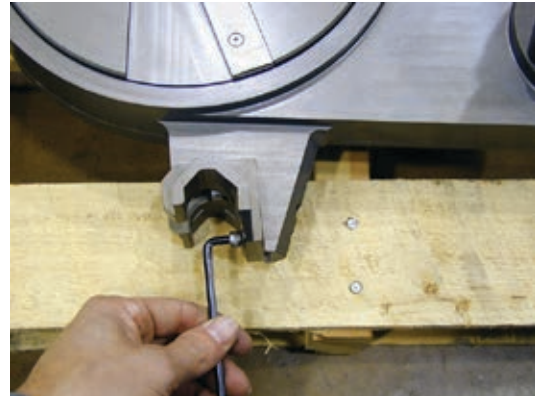
Loosen facer locking bolt.



PHO1930-11-15-00

Lift facer out of the carriage and set on cardboard or wood blocks off of ground.

Remove rear guide rod bracket.



PHO1981-11-15-00

Attach rear guide rod bracket in the position shown.



PHO1980-11-15-00

Special Operations

Top Loading Facer (continued)

Manual Facer Operation

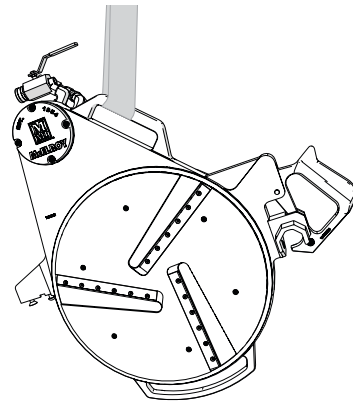
CAUTION

The machine components are heavy. Using one person to lift the facer or carriage may result in an injury. Use a lifting strap and an overhead lifting device to lift facer or carriage. For manual lifting, two people are required to lift the facer or carriage.

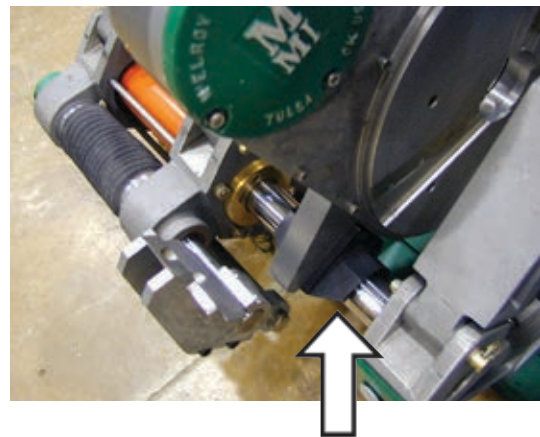
For the TracStar 412 and 618, use a lifting strap or a two person lift to lift the facer.

The TracStar 28 and 250 can be lifted by a single person.

Lock onto back guide rod, then latch on front guide rod.



CD01829-09-15-16



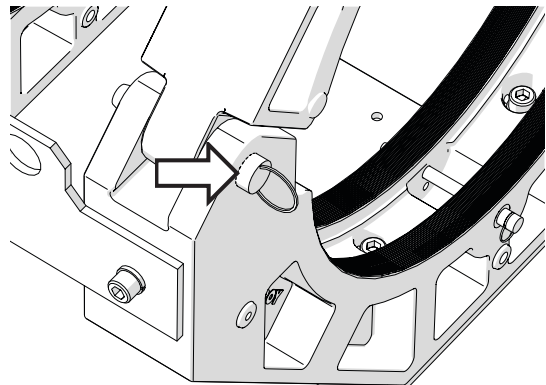
PH01946-11-15-00

TX05294-04-06-17

Remove Upper Jaws

If the carriage is going to be hand carried, or if the carriage needs to be hoisted and slid underneath the pipe, the top jaws need to be removed.

Loosen all clamp knobs. Take out the detent pins securing the top jaws and remove the jaws.



CD01825-09-15-16

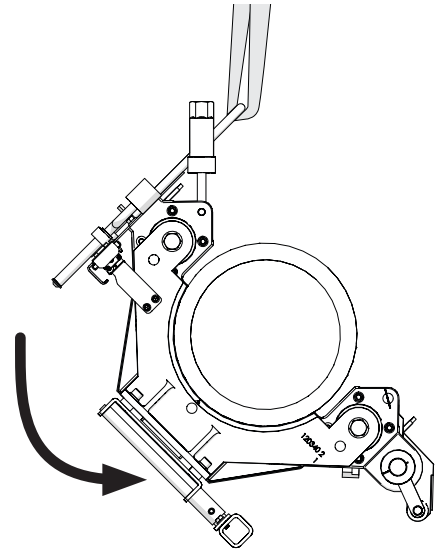
TX01479-04-06-17

Special Operations

Make Fusion Joint

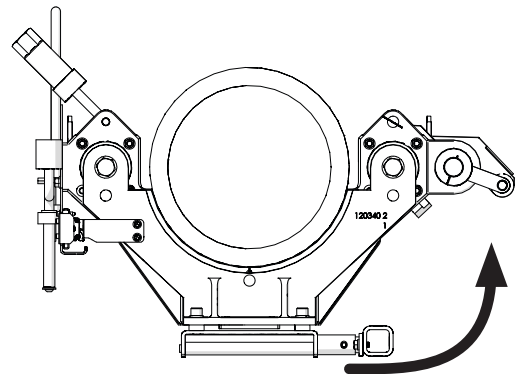
Clamp Carriage Assembly to Pipe

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



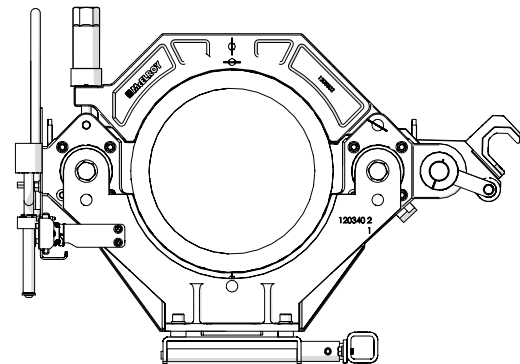
CD01877-04-06-17

Rotate carriage assembly around to a normal upright position.



CD01878-04-06-17

Attach the top jaws and loosely clamp around pipe.



CD01879-11-30-16

Special Operations

Make Fusion Joint (continued)

Attach Hydraulic Hoses

There are two sets of hydraulic extension hoses. One set connects to the carriage hoses on the machine and to the carriage. The other set connects to the facer hoses on the machine and to the facer.

Connect all hoses.

IMPORTANT: Machines with hydraulic clamping will have an extra set of hoses at the carriage location.

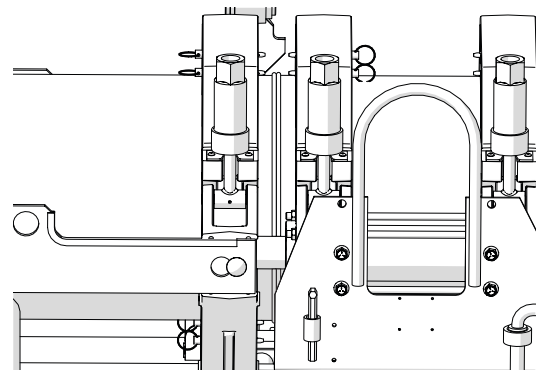


PH05639-09-06-16



PH05640-09-06-16

Refer to the "Operation - General" for operating instructions.



CD01867-11-29-16

Lifting

Lifting Safety

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

⚠️WARNING

Safety warnings:

1. Do not exceed rated load or lift loads greater than the rated load of the lifting device.
2. Do not operate a damaged or malfunctioning lifting 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 lifting device operator's manual before use.
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.

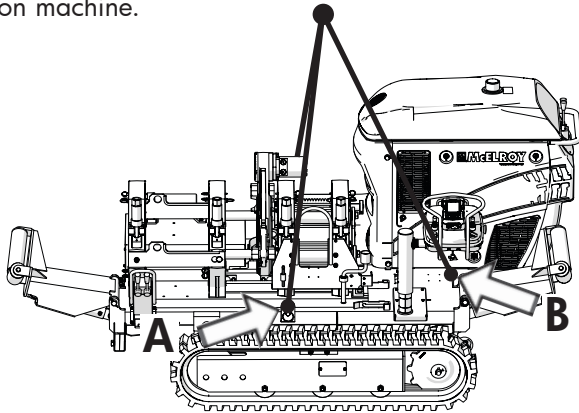


Lifting

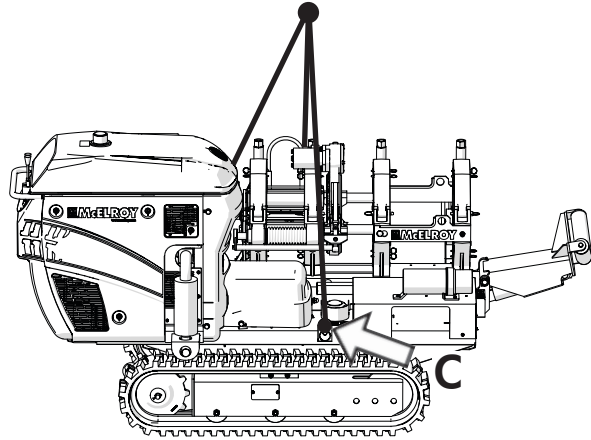
Lift Fusion Machine

The sling has equal length cables, attach the sling to the three lifting points. The cable attached at position (A) will run between the moveable jaws of the carriage. Move the carriage so that the cable does not come into contact with the jaws when lifting.

Lift fusion machine.



CD01880-11-30-16



CD01881-11-30-16

TX02331-10-25-04

Lift 4-Jaw or 3-Jaw Carriage

4-Jaw Carriage

Attach lifting sling to the manifold bracket and the far side lift point on the fixed jaw brace.

Self Retracting Heater: Attach lifting sling to the right upright and both lift points on the fixed jaw braces then lift the carriage assembly.

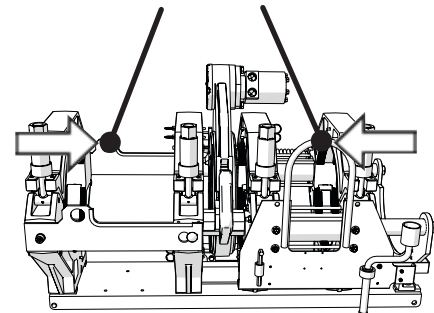
Lift carriage assembly.

3-Jaw Carriage

Attach lifting strap to the manifold bracket.

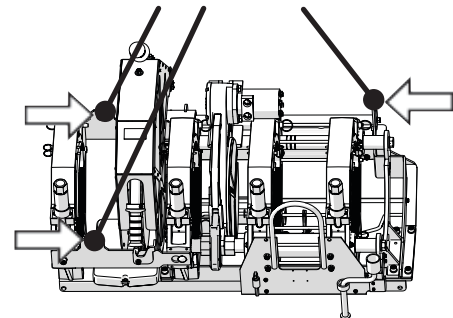
Lift carriage assembly.

TX05361-04-16-18

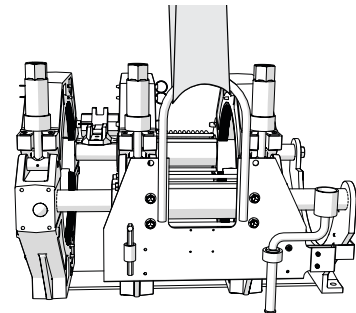


CD01873-11-30-16

Self Retracting Heater



CD02202-04-05-18



CD01875-11-30-16

Maintenance

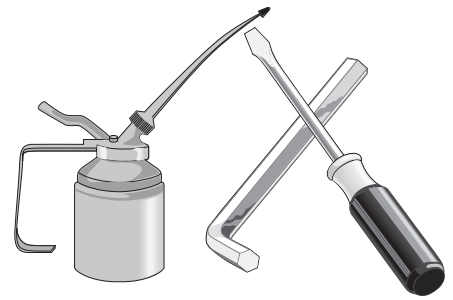
Preventative Maintenance

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.

TX00428-8-10-95



CD00142-11-2-94

Washing the Machine

Cover plugs and electrical control boxes before washing.

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

Do not pressure wash.

TX00429-03-31-16



CD00178-5-3-96

Check Hydraulic Fluid

The hydraulic fluid level should be checked daily.

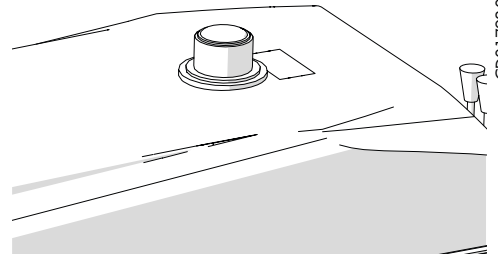
Refer to the "Hydraulic Fluids" section of this manual for hydraulic fluid recommendations.

If fluid is not visible in the reservoir strainer, fill reservoir until fluid is visible in the strainer. Do not overfill reservoir as the fluid will expand as it heats up.

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

Use only clean fluid from an unopened container.

TX02332-02-27-14



CD01792-08-17-16

Change Hydraulic Fluid and Filter

The hydraulic fluid and filter (A) should be replaced after every 400 hours of operation. If the restriction gauge is in the red while the facing is running, change the hydraulic fluid and filter.

If changing oil based on the ISO Cleanliness guidelines, the target level is 19/16/13 and the maximum level is 21/19/16.

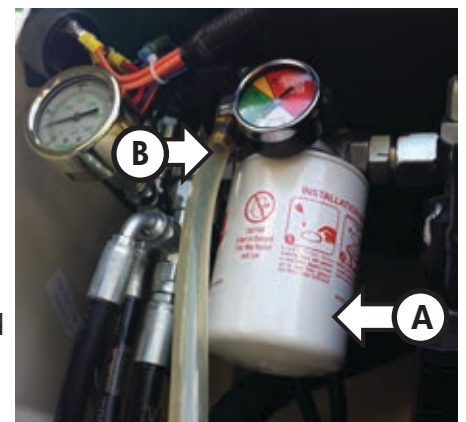
The level contains three numbers. The first represents the number of particles equal to or larger than 4µm per milliliter of fluid. The second represents the number of particles equal to or larger than 6µm per milliliter of fluid. The third represents the number of particles equal to or larger than 14µm per milliliter of fluid.

Fluid should also be changed as extreme weather conditions dictate.

To drain tank, remove the cowl and place the drain tube into a container and open drain valve (B).

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

TX05188-04-10-17



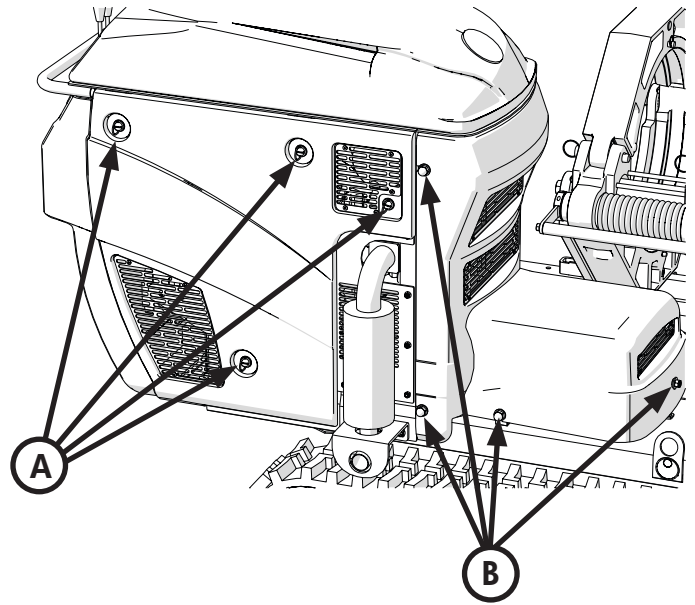
PH056420921-1-16

Maintenance

Remove Cowlings

To Remove Side Cowlings:

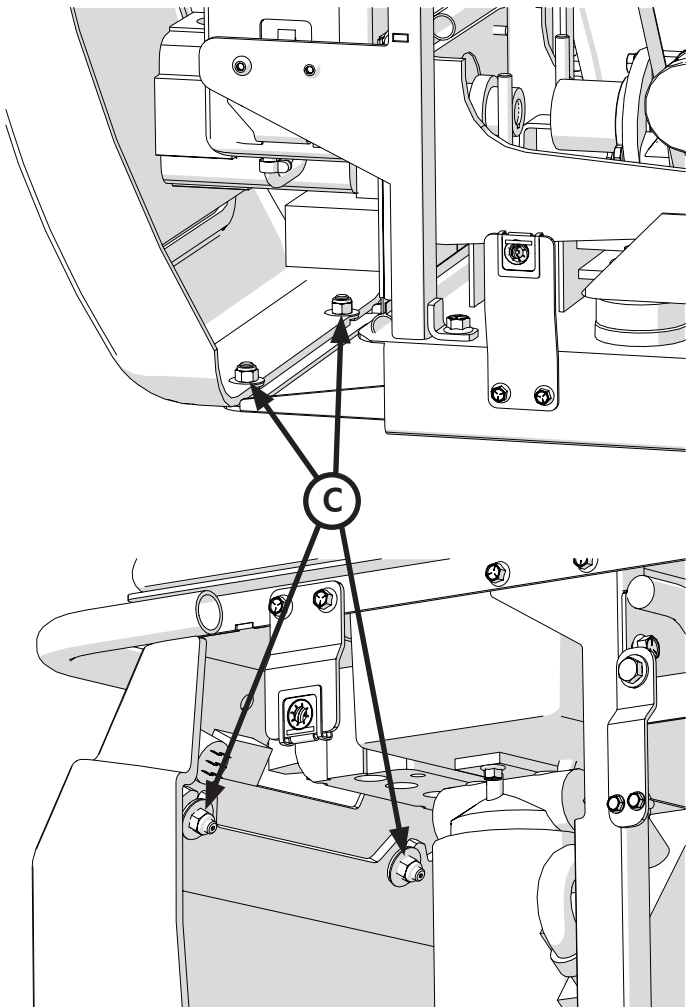
Flip up the ring on the fasteners (A) and turn them 90° to release. Remove the cowling.



CD01836-09-20-16

To Remove Front Cowlings:

Loosen and remove the nuts (B) that attach the cowling to the machine. Remove the cowling.



CD01837-09-20-16

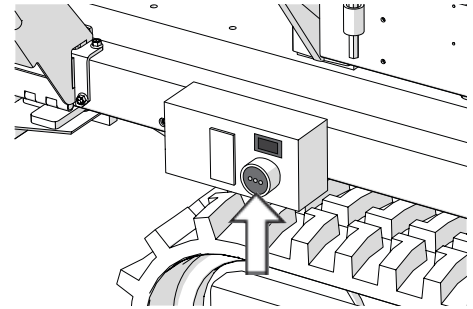
CD01838-09-20-16

TX05178-09-28-16

Maintenance

Setting Engine Speed

With the engine running at max speed plug the heater in.
Check the voltmeter above the heater receptacle.



Adjust throttle cable sheath until voltage is correct.

The voltmeter should read $240V \pm 5$.



When the engine speed is adjusted, the hydraulic flow rate needs to be checked to verify it is within range.

Check hydraulic flow rate:

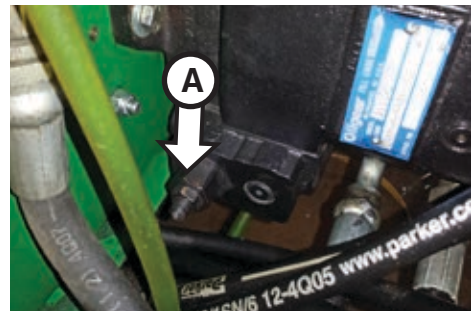
Remove the left side cowling to gain access to the hydraulic pump.

Disconnect both facer hose quick disconnects from the facer. Install flow meter kit (AT1214801) in between the two facer hoses.

Start the engine to check hydraulic flow rate. The flow rate should be 8 gpm (± 0.1).

To adjust the flow, loosen the jam nut and turn the screw (A) until the flow rate is 8 gpm (± 0.1). Retighten the jam nut.

TX05362-04-09-18



Adjusting System Pressure

Remove the right side cowling to gain access to the hydraulic pump.

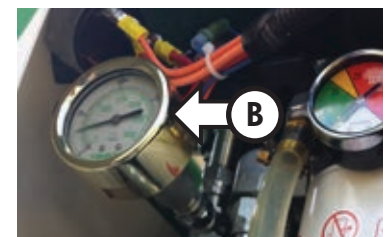
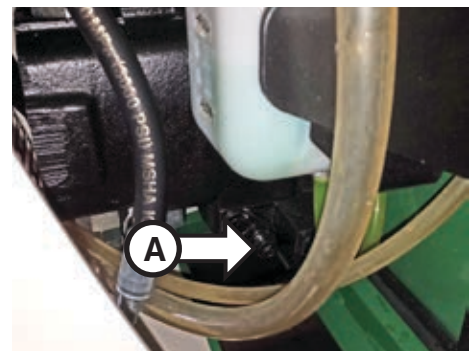
Start the engine and select high speed.

The system pressure is 2000 psi. Use the system pressure gauge (B) next to the hydraulic filter to set the system pressure.

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

NOTICE: Do not adjust screw on opposite side of pump.

CAUTION This machine has moving parts when the machine is in operation. Use caution when making pressure adjustments while the machine is running and avoid the moving parts. Failure to do so could result in minor or moderate injury.



TX05179-09-22-16

Maintenance

Bleeding Air From Hydraulic System

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:

The bleed plugs are on the cylinder glands.

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 as low as it will go before proceeding.



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.

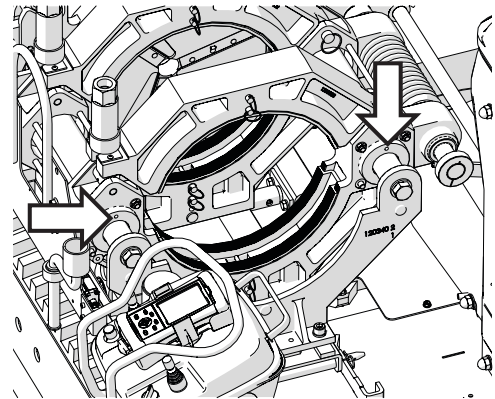
Loosen the bleed plug on one cylinder next to the fixed jaw.

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.

TX05180-04-10-17



CD01882.11-30-16

Engine Oil System

Change engine oil and filter after the first 50 hours of operation. After the first oil change, change the oil every 100 hrs and the filter every 200 hours of operation. Read the engine maintenance instructions and use the appropriate oil for the ambient temperature.

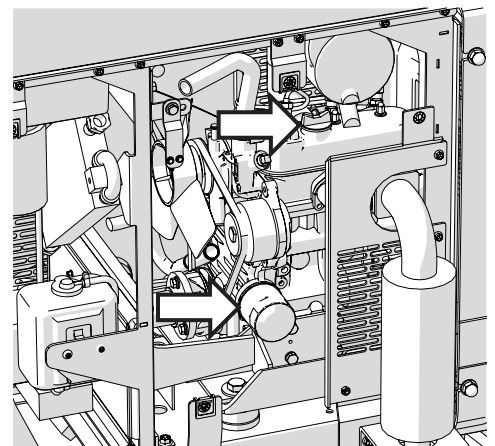
If using high sulfur fuel (>5000 ppm), consult engine manual for reduced maintenance intervals and appropriate oil.

The oil filter is located behind the right side cowling. The dipstick is on the opposite side of the engine.

The oil drain plug is located on the bottom of the oil pan.

The oil filler cap is located on top of the engine.

TX05181-09-28-16

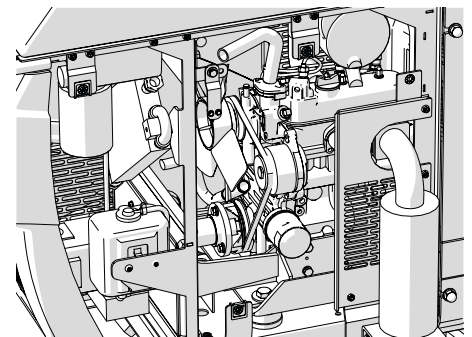


CD01841-09-21-16

Engine Maintenance

Refer to the operation and maintenance manual for the engine for all recommended maintenance, including air filter and fuel filter service intervals.

TX02337-10-25-04



CD01841-09-21-16

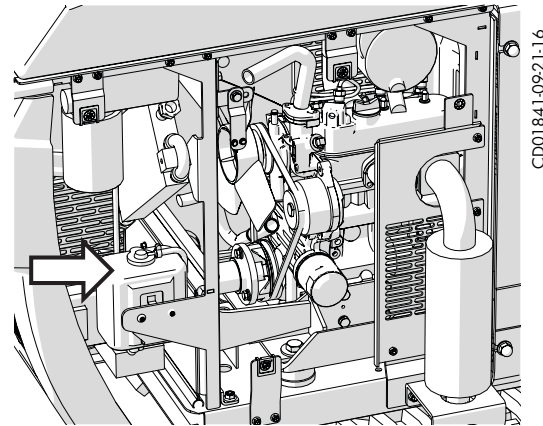
Maintenance

Check/Add Antifreeze

Add antifreeze in a 50/50 mix with water as needed.

Replace antifreeze mixture once each year or as recommended in engine manual.

TX05183-09-22-16



CD01841-09-21-16

Facer Blades

Ensure the machine is off.

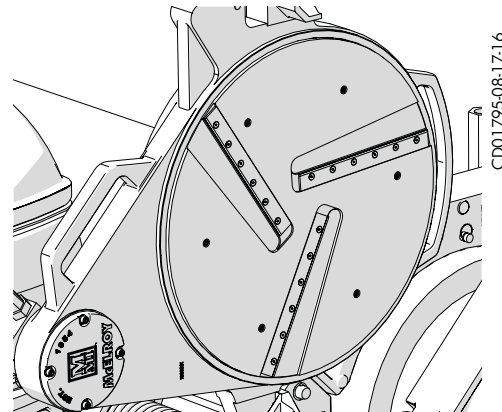


WARNING Facer blades are sharp and can cut. Never attempt to remove shavings while the facer is running, or is in the facing position between the jaws. Use care when operating the facer, and when handling the unit.

Facer blades bolt directly to the blade holders and should be inspected for damage and sharpness. Dull or chipped blades must be replaced.

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

TX04939-04-18-16



CD01795-08-17-16

Clean Heater Surfaces



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

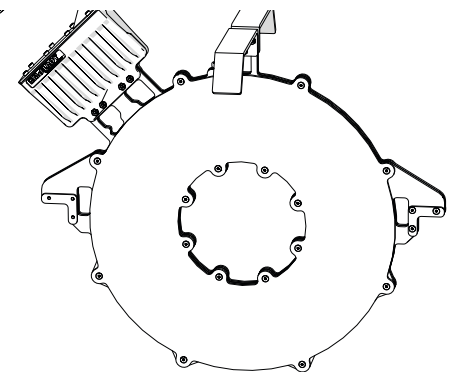
The butt fusion heater plate faces must be kept clean and free of any plastic build up or contamination. Plastic build up is best removed when the heater surfaces are at fusion temperature using a clean dry non-synthetic cloth. Synthetic cloths may melt to the heater surfaces under fusion temperature.

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

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

NOTICE: Do not use any abrasive materials to clean heater surfaces. Use only a non-synthetic cloth that won't damage heater surfaces.

TX00440-04-18-16



CD01798-08-17-16

Maintenance

Installing Butt Fusion Heater Plates

Install butt fusion heater plates while the heater is cool.

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

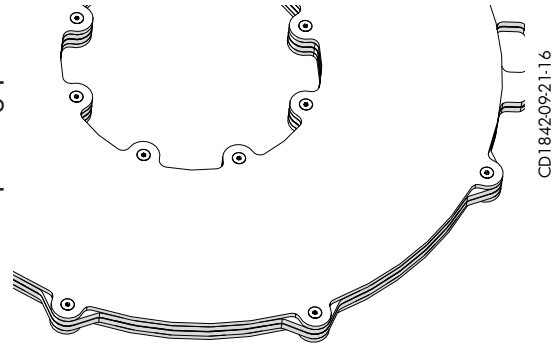
Butt fusion heater plates are installed with stainless steel cap screws. Always use high temperature anti-seize compound on mounting screw threads for easier removal later.

The butt plates are coated on one side with an antistick coating. Install the butt plates with the non-coated side against the heater body.

Carefully ensure that the butt fusion heater plates are seated completely on the heater body, and that there is no foreign matter trapped between the butt plates and heater body.

IMPORTANT: Do not over tighten the bolts.

TX02716-04-18-16



Track Tension

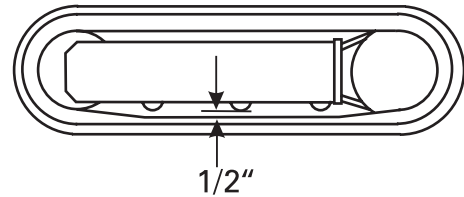
Park the machine on a flat solid surface.

Use the lifting sling to raise 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.

TX01885-09-22-16



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. Never loosen grease valve more than one turn. Injury could also result if the grease nipple is loosened. Never loosen the grease nipple.

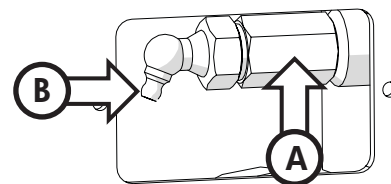
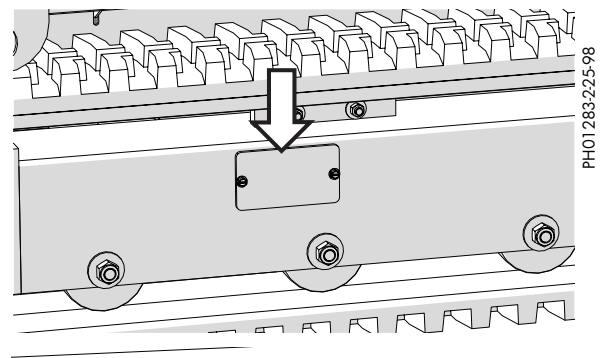
Remove screws and cover to access the adjustment system.

To loosen the track, turn hex shaped valve (A) counterclockwise no more than 1 turn. If grease does not start to drain out, then slowly rotate the track. When correct track tension is obtained, turn valve clockwise and tighten it. Clean off any expelled grease.

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

Replace access cover.

TX01898-11-15-00



Maintenance

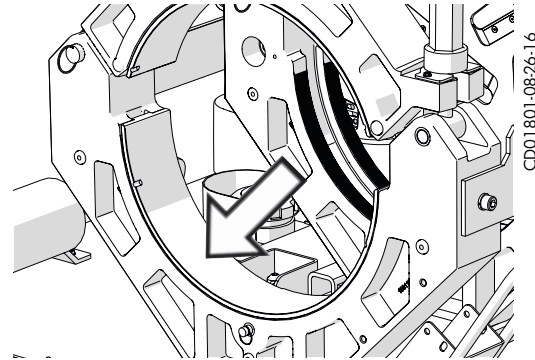
Clean Jaws and Inserts

Ensure the machine is off and disconnected from power source.

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

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

TX00433-04-18-16



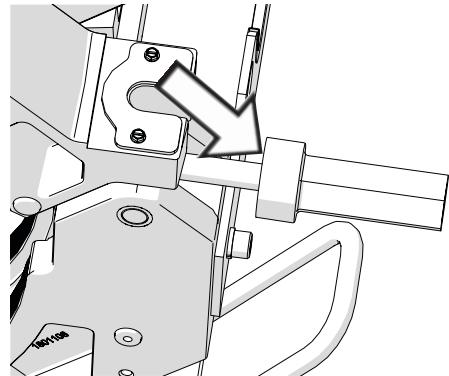
CD01801-08-26-16

Clean Thrust Bearings

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

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

TX00434-9-13-94

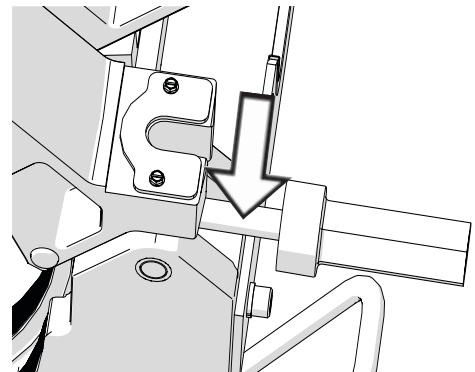


CD01845-09-21-16

Clean Eyebolt Threads

Keep the clamp knob eyebolt threads brushed clean.

TX00435-9-13-94

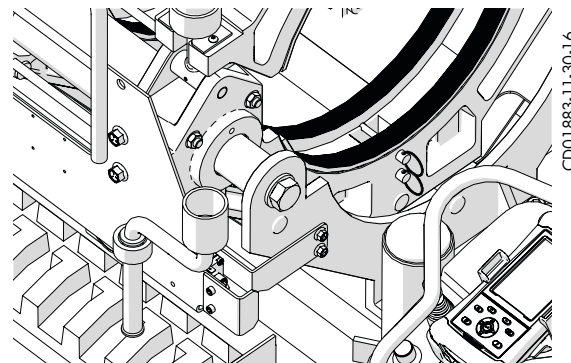


CD01845-09-21-16

Fasteners Must Be Tight

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

TX00437-9-13-94



CD01883-11-30-16

Maintenance

Battery Replacement and Charging

Remove the vehicle deck cover.

The battery for the vehicle is under the cover below the deck of the vehicle.

Disconnect the battery by removing the negative (black) cable first and then remove the positive (red) cable.

To remove the battery, remove the bolt (A) and remove the battery holders.

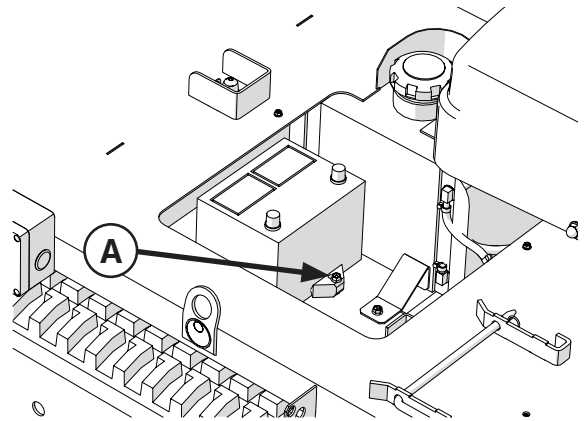
Replace the battery with one that meets all of the requirements listed below.

- Group Size: 70 battery
- Cold cranking amperes at 0°F (-18°C): 525 (CCA)
- Cranking amperes at 32°F: 630 (CA)

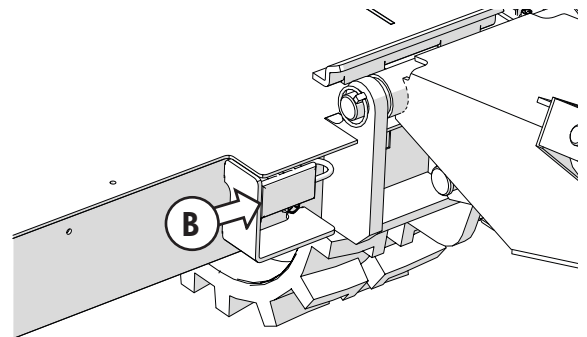
Battery Charging Connection

The battery can be charged through a remote battery connector (B) mounted on the front of the vehicle. Ensure the connector has its dust cover on when not in use.

The plug type for the charging connection is an Anderson Power Products SB175 connector.



CD01711-06-28-16



CD01711-06-28-16

TX05184-04-10-17

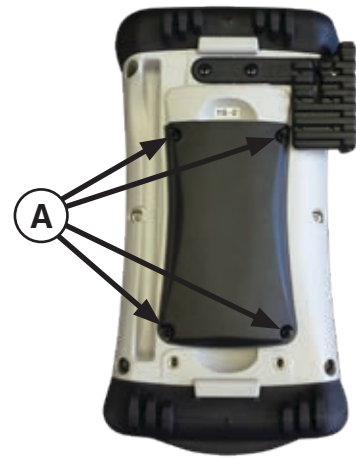
Maintenance

Install SIM Card

The handheld computer has the capability to use a SIM card for a data connection.

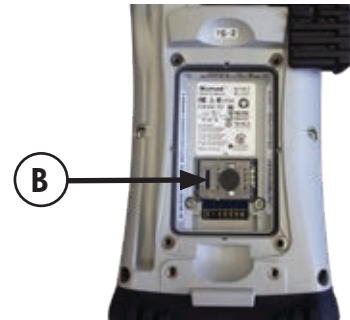
A SIM card can be purchased through a cellular carrier. The Trimble® Nomad handheld computer uses GPRS, Edge, or 2.5G SIM cards.

Turn the computer to the back and remove the 4 screws (A) from the back cover and remove.



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Remove the battery to expose the SIM card holder (B).



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Slide the holder to the Unlock position (C) and open the holder.



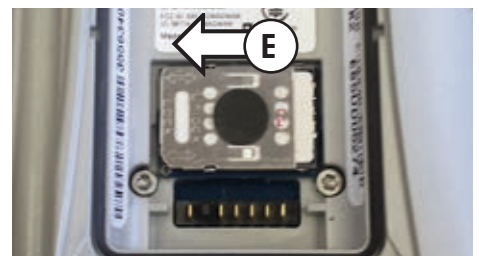
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Insert the SIM card (D) into the holder and close the holder.



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Slide the SIM card holder to the Lock position (E).
Install the battery back into the computer.
Replace the back cover and install with the 4 screws.




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Maintenance

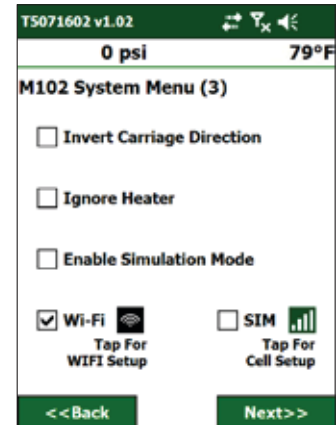
Install SIM Card (continued)

Navigate to screen 3 of the System Menu.
Check the SIM box to enable the SIM card.
Tap the SIM icon. 

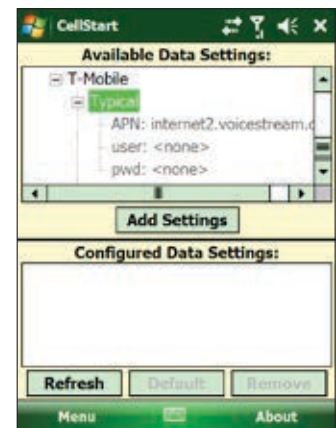
Select the carrier in your region of your SIM card.
Select the carrier SIM Card setting based on the APN of your SIM card.

Tap **Add Settings** to add the configured data setting.
Tap the close icon  to close the data settings screen and return back to the System Menu.

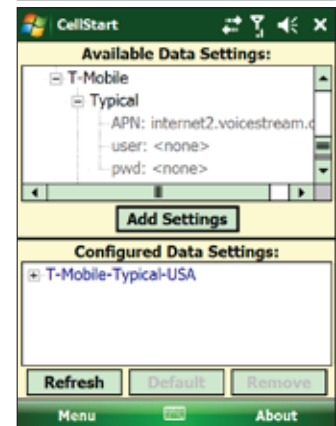
The configured data setting can be refreshed, set as default, or removed by selecting the data setting and choosing one of the three buttons below.



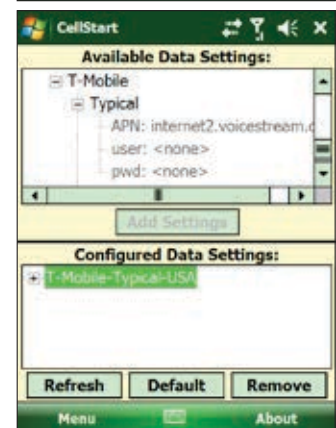
PH05624-06-06-16



PH05616-07-07-16



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Maintenance Checklist

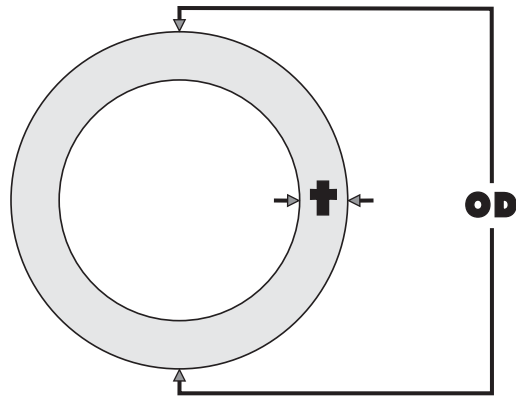
Fusion Machine Checklist

| Items to Check | OK |
|--|----|
| UNIT | |
| Machine is clean | |
| All pins and snaprings are in place | |
| All nuts and bolts are tight | |
| All identification placards and handles are in place | |
| All safety labels and decals are in place. | |
| All clamp knobs are lubricated and turn freely | |
| Wiring, battery cables, & all electrical terminals | |
| Cords and plugs are in good condition | |
| Hydraulic oil level is correct | |
| No oil or water leaks (engine and hydraulic system) | |
| Rubber tracks in good condition | |
| Fuel tank full | |
| Engine crankcase is filled to correct level | |
| Cooling system level is correct | |
| Hydraulic hoses are in good condition | |
| Engine starts and runs properly | |
| Jaws are properly aligned | |
| Facer pivot operates properly | |
| Facer operates smoothly | |
| Face-off is square | |
| Inserts fit and pin properly | |
| Voltage to heater is correct | |
| Pendant control operate properly | |
| Handheld computer operates properly | |
| Heater cord and plug are in good condition | |
| Heater surface is clean and in good condition | |
| Thermometer is in good working order | |
| Surface temperature checked with pyrometer | |
| Throttle control works properly | |
| Low Oil /alarm works | |
| Primary pump pressure 2000 psi | |
| Hydraulic carriage works smoothly | |
| Check receptacles for damage | |
| | |

Determining Fusion Pressure

Variable Definitions

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



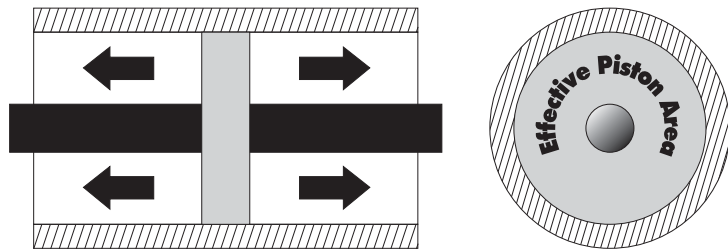
Formulas

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

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

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

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



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

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

TEPA = 4.71 (From Table)

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

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

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 | - | - |

Hydraulic Fluids

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.

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| 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 | DTE 10 Excel 15 | 15.8 | 4.1 | 168 | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | -16 - 113 | -27 - 45 |
| | DTE 10 Excel 32 | 32.7 | 6.6 | 164 | | | | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | 12 - 154 | -11 - 68 |
| | DTE 10 Excel 46 | 45.6 | 8.5 | 164 | | | | ***** | ***** | ***** | ***** | ***** | ***** | ***** | ***** | 23-173 | -5 - 78 |
| | DTE 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 |

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

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

Specifications

TracStar® 28, 250, 412, 618 Series 2 Auto Fusion Machine Specifications:

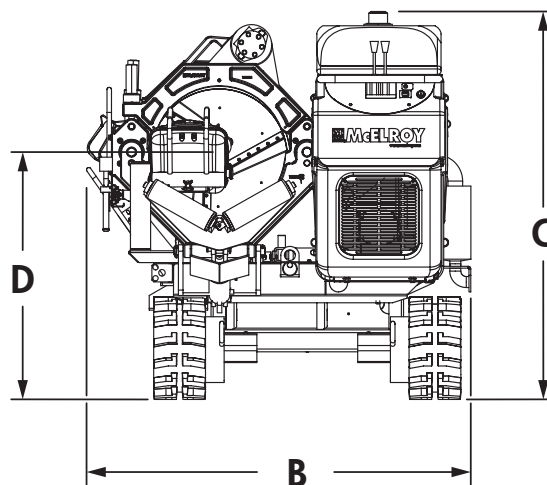
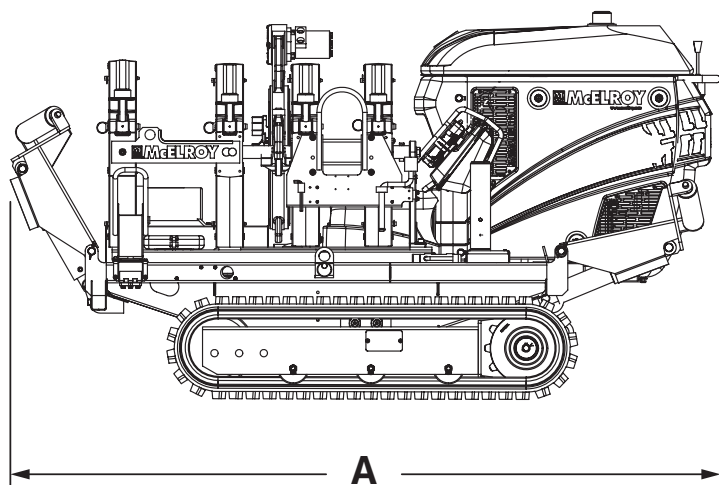
- Engine: 20 HP Liquid cooled
- Starting System: Electric
- Fuel Type: Diesel
- Fuel Tank Capacity: 5 Gals.
- Operational Tank Capacity: 8 Hrs.
- System Pressure: 2000 PSI
- Hydraulic Reservoir Capacity: 8 Gals
- Vehicle Speed: 1.5 MPH
- AC Output: 240V, 60Hz, 15 Amp

| Machine Model | Dimensions | | | | Weight Entire Machine* |
|----------------|-----------------|-----------------|-----------------|----------------|------------------------|
| | A | B | C | D | |
| 28 | 97" (2464mm) | 53" (1346mm) | 53" (1346mm) | 28" (711mm) | 1957 lbs. (888 Kg) |
| 250 | 97" (2464mm) | 53" (1346mm) | 53" (1346mm) | 29" (737mm) | 1953 lbs. (886 Kg) |
| 412 | 97" (2464mm) | 53" (1346mm) | 53" (1346mm) | 31" (787mm) | 2136 lbs. (969 Kg) |
| 412 SRH | 97" (2464mm) | 53" (1346mm) | 53" (1346mm) | 31" (787mm) | 2209 lbs. (1002 Kg) |
| 618 | 97" (2464mm) | 53" (1346mm) | 53" (1346mm) | 34" (864mm) | 2313 lbs. (1049 Kg) |

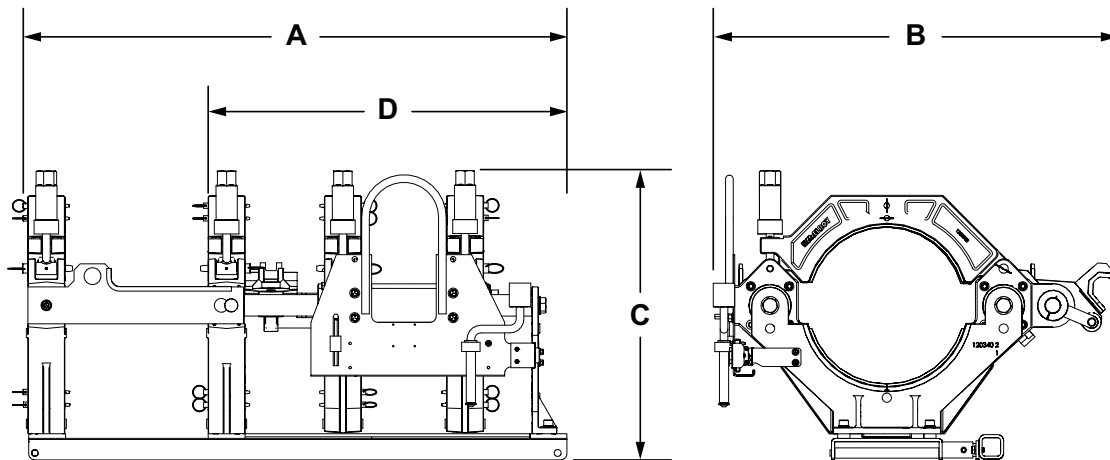
*Entire machine weight includes heater and facer

TracStar vehicle weight: 1707 lbs. (774 Kg)

SRH - Self Retracting Heater



Specifications



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| Pit Bull model | Minimum Pipe Size | Maximum Pipe Size | Weights lbs (kg) | | | Heater Power Watts | Dimensions in (mm) | | | | | |
|--|-------------------|---------------------|---------------------|--------------|----------------------|-----------------------|--------------------------------------|-------------|---------------|---------------|----------------|-------------|
| | | | Carriage* | Facer | Heater/ with Bag | | A | B | C | | D | |
| | | | | | | | | | | | | |
| 28 | 2" IPS (63mm) | 8" DIPS (225 mm) | 208 (94) | 44 (19.9) | 21/42 (9.5/19) | 1750 | 44 (1118) | 25 (635) | 19 (483) | 30 (762) | | |
| 250 | 2" IPS (63mm) | 250mm | 204 (93) | 44 (19.9) | 21/42 (9.5/19) | 3000 | 44 (1118) | 25 (635) | 19.5 (495) | 30 (762) | | |
| 412 | 4" IPS (110mm) | 12" DIPS (340mm) | 385 (175) | 62 (28.1) | 24/44 (10.9/19.9) | 3000 | 44 (1118) | 31 (787) | *38 (965) | 24.5 (622) | *26.5 (673) | 29 (737) |
| 412 SRH ¹ | 4" IPS (110mm) | 12" DIPS (340mm) | 502 (228) | 62 (28.1) | — | 3000 | 44 (1118) | 37 (940) | *42 (1067) | 32.5 (826) | 29 (737) | |
| 618 | 6" IPS (180mm) | 18" OD (450mm) | 548 (249) | 94 (42.6) | 34/58 (15.4/26) | 3000 | 44 (1118) | 38 (965) | *43 (1092) | 27.5 (699) | *30 (762) | 29 (737) |
| * Carriage weights include detachable facer | | | | | | | * Dimensions with hydraulic clamping | | | | | |
| For 412 and 618 carriages with Hydraulic Clamping, add 40 lbs. (18 Kg) | | | | | | | | | | | | |
| SRH ¹ - Self Retracting Heater, Heater weight included with carriage weight | | | | | | | | | | | | |

CD02022-04-09-18

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.

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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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