

Operator's Manual



McELROY

www.mcelroy.com



TRACSTAR 500 SERIES 3

Auto Fusion Machine

Manual: T5019211 Revision: C 08/18
Original Language: English



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

WARNING

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

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

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

8163362

Introduction

Thank You for purchasing this McElroy product

The TracStar® 500 Series 3 Auto is a self-contained, self-propelled, all terrain fusion machine, and is designed to produce consistently high quality polyolefin pipe butt fusion joints.

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

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

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

Always return the manual to the literature compartment.



TX04465-10-24-12

McElroy University

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

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

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

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 aforesaid obligation are hereby disclaimed by McElroy.

PRODUCT IMPROVEMENT

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

INFORMATION DISCLOSED

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

PROPRIETARY RIGHTS

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

LAW APPLICABLE

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

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

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

Model No. _____

Serial No. _____

Date Received _____

Distributor _____

Table of Contents

Safety

Safety Alerts	1-1
Read and Understand	1-1
General Safety	1-2
Wear Safety Equipment	1-2
Fuel Handling	1-2
Units with Engines	1-3
Carbon Monoxide	1-3
Do Not Operate in a Hazardous Environment	1-3
Crush Points	1-3
Pipe Handling Safety	1-4
Battery	1-4
Electrical Safety	1-5
Units with Hydraulics	1-5
Facer Blades Are Sharp	1-6
Keep Machine Away From Edge of Ditch	1-6
Operating Fusion Machine	1-6
Heater is Hot.	1-7
Personal Lifting Safety	1-7
Do Not Tow TracStar	1-7
Fusion Procedures	1-7

Overview

Theory of Heat Fusion	2-1
TracStar [®] 500 series 3 Console	2-2
Auto Throttle	2-2
The Coach McElroy Fusion Control Pendant	2-2
Control Box	2-3
Alternate Drive Controls	2-3
Pipe Lift Controls	2-3
Carriage Assembly	2-3
Facer	2-4
Indexer Controls	2-4
Heater	2-5
Diesel Engine	2-6
Hydraulic Fluid Reservoir	2-6
Hydraulic Fluid Filter	2-6
Hydraulic Clamping	2-6
Pendant Handheld Computer	2-7
Pendant Computer Interface	2-8
DataLogger [®] Vault [™]	2-9

COPYRIGHT © 2018, 2017, 2012, 2006

McELROY MANUFACTURING, INC.

Tulsa, Oklahoma, USA

All rights reserved

All product names or trademarks are property of their respective owners. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Table of Contents

Operation - General

Read Before Opening	3-1
Check Hydraulic Fluid Level	3-1
Diesel Engine	3-1
Moving Machine Into Position	3-2
Prepare Heater	3-2
Install Clamping Inserts	3-3
Set up Pipe Supports	3-3
Loading Pipe Into Machine	3-3
Positioning Pipe In Machine	3-3
Hydraulic Clamping	3-4
Begin Facing	3-5
After Facing	3-5
Check Alignment	3-6
Check Heater Temperature	3-6
Completing the Fusion Operation	3-7

Operation - Auto Fusion

Auto Fusion	4-1
Create Dummy Joint (Optional)	4-9
View Joint Report	4-10
Opening Movable Jaws	4-12
Opening Fixed Jaws	4-12
Raise Pipe	4-12
Position Pipe for Next Joint	4-12
Install Next Piece of Pipe	4-13
Make Next Joint	4-13
Auto Report Menu	4-14

Operation - Semi-Auto Fusion

Semi-Auto Fusion	5-1
Determine Drag Pressure	5-1
Set Pressures	5-1
Check for Slippage	5-2
Set Temperature	5-2
Carriage Indexer Heater Position	5-2
Cleaning Heater	5-3
Heat Pipe	5-4
Fusing the Pipe	5-4
Opening Movable Jaws	5-5
Opening Fixed Jaws	5-5
Raise Pipe	5-5
Position Pipe for Next Joint	5-5
Install Next Piece of Pipe	5-5

Table of Contents

System Menu

System Menu (1)	6-1
System Menu (2)	6-4
System Menu (3)	6-5
System Menu (4)	6-5
System Menu (5)	6-7

Special Operation

Special Operations Overview	7-1
4-Jaw Carriage Removal	7-2
3-Jaw Carriage Removal	7-3
Remove Upper Jaws	7-8
Make Fusion Joint	7-8

Lifting

Lifting Safety	8-1
Required Equipment	8-1
Attach Slings	8-2

Maintenance

Preventative Maintenance	9-1
Washing the Machine	9-1
Check Hydraulic Fluid	9-1
Change Hydraulic Fluid and Filter	9-1
Grease	9-2
Adjusting System Pressure	9-2
Bleeding Air From Fuel Line	9-2
Engine Oil System	9-3
Facer Blades	9-4
Clean Jaws and Inserts	9-4
Bleeding Air From Hydraulic System	9-5
Installing Butt Fusion Heater Plates	9-5
Clean Heater Surfaces	9-6
Fasteners Must Be Tight	9-6
Engine Maintenance	9-6
Checking Track Tension	9-7
Adjusting Track Tension	9-7
Checking Track Gearbox Oil	9-8
Changing Track Gearbox Oil	9-8
Install SIM Card	9-9

Table of Contents

Maintenance Checklist

TracStar [®] 500 series 3 Auto	10-1
---	------

Determining Fusion Pressure

Determining Fusion Pressure	11-1
---------------------------------------	------

Hydraulic Fluids

Hydraulic Fluids	12-1
----------------------------	------

Specifications

TracStar [®] 500 series 3 Auto Specifications	13-1
--	------

Fusion Equipment Safety

Safety Alerts



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

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



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



WR00051-11-30-92

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.



WR00052-12-1-92

TX02946-4-15-09

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.

TX00114-4-22-93

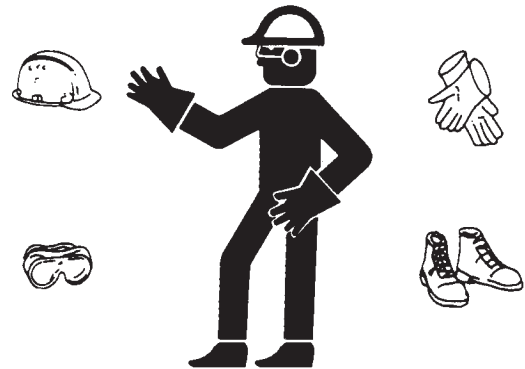


SAFE1ST122292

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.



WIR00053-12-2-92

TX00032-04-18-16

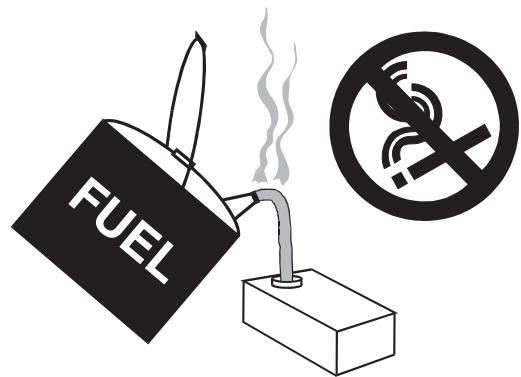
Fuel Handling



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



Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher sulfur content. Avoid death or serious injury from fire or explosion; consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.



CD00365-2-19-97

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.

TX00953-05-12-17

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.

TX04881-03-14-16



WR00080-4-12-93

Carbon Monoxide

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

TX00954-04-18-16



WR00093-5-14-96

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.

TX00796-04-18-16



WR00080-4-12-93

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.

TX03004-04-18-16



WR00012-12-4-92

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.

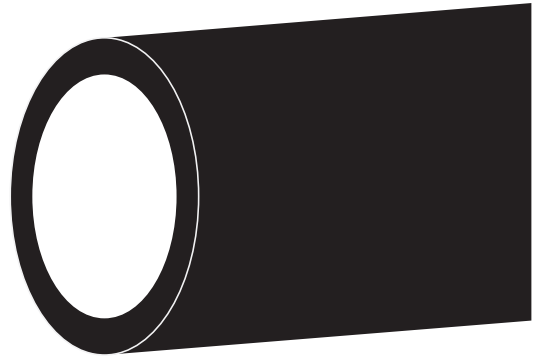
⚠ WARNING Pipe that is bent can store a great amount of energy. Do not bend and force the pipe into the machine. A bent pipe with stored energy can generate tremendous force when that energy is released.

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.



WR00097-4-17-13

TX04882-04-18-16

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.



CD00176-9-14-95



CD00177-9-14-95

TX00650-04-18-16

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 battery before attempting any maintenance or adjustment.



TX04468-10-24-12

WR00055-4-7-93

WR00025-11-30-92

Units With Hydraulics

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

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

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

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



TX03007-10-12-10

WR00078-4-8-93

Safety

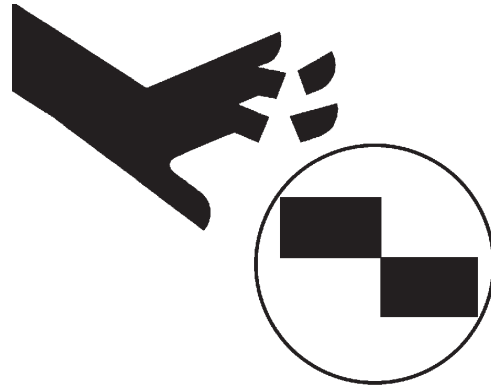
Facer Blades Are Sharp

⚠️ 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.



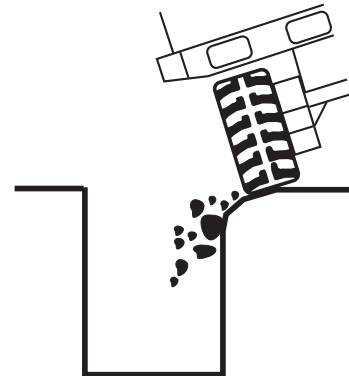
WR00073-4-6-93

TX02378-04-18-16

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.



CD00408-12-31-97

TX01447-04-18-16

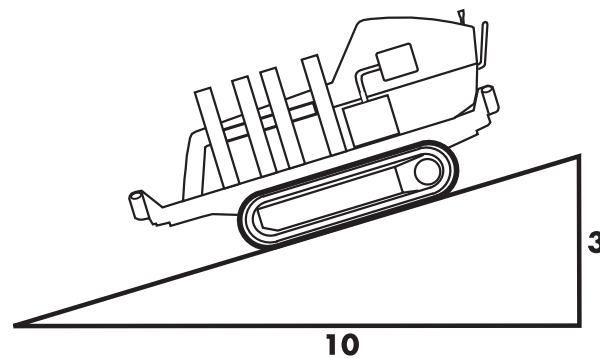
Operating Fusion Machine

Place fusion machine on as level ground as possible.

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

⚠️ WARNING

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



CD00402B-12-30-97

TX01902-3-30-11

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.

TX04244-04-18-16

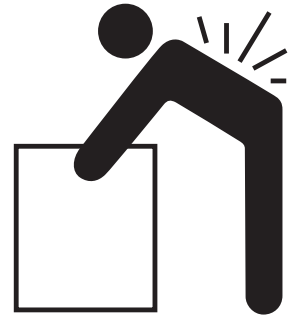


WR000302-10-93

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.

TX05159-09-22-16



HeavyLifting5-25-10

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.

TX04245-04-18-16



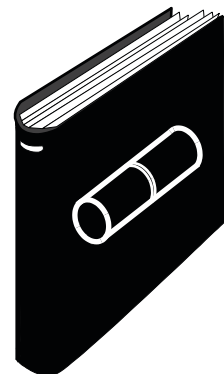
CD00401-1-12-30-97

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.

TX02984-04-18-16



WR00079-1-24-96

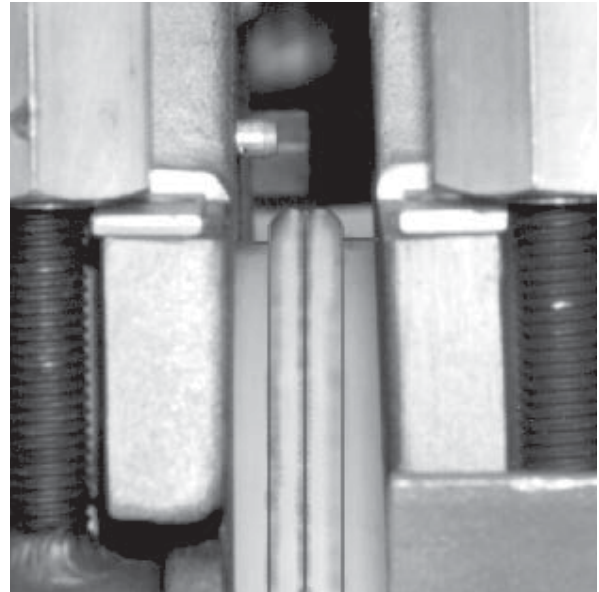
Overview

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:

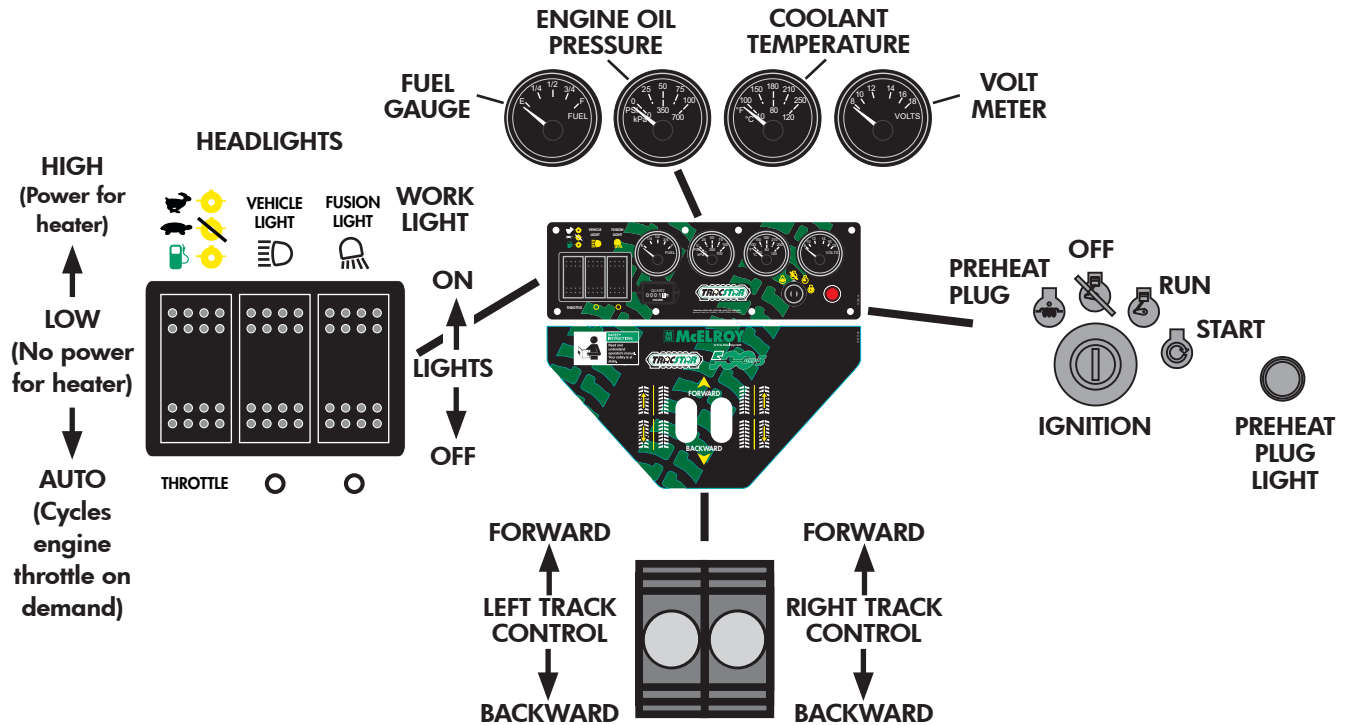
- Clamping** The pipe pieces are held axially and radially to allow all subsequent operations to take place.
- Facing** The pipe ends are faced to establish clean, parallel mating surfaces perpendicular to the centerline of the pipes.
- Aligning** The pipe ends are aligned with each other to minimize 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.



PH00363B-1-4-96

Overview

TracStar® 500 series 3 Console



CD00407e-10-8-12

Auto Throttle

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

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

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

TX04470-10-24-12



PH04789-10-8-12

The Coach® McElroy Fusion Control Pendant

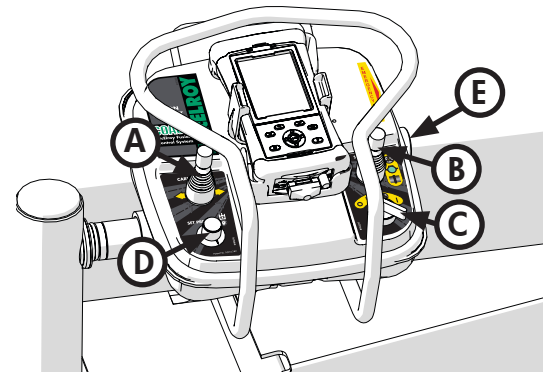
The fusion control pendant is the operator interface for machine fusion controls and is used to control pressures and times to meet selected fusion standards.

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



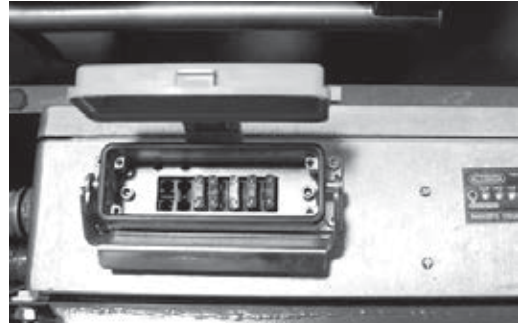
CD01859-11-16-16

Overview

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.

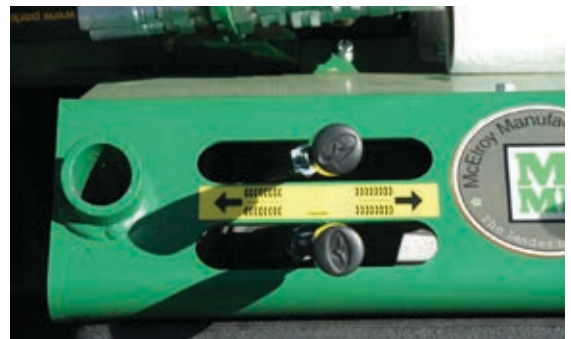


PH012893-3-98

TX05199-03-06-17

Alternate Drive Controls

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



PH04729-10-1-12

TX02002-4-24-02

Pipe Lift Controls

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



PH04730-10-1-12

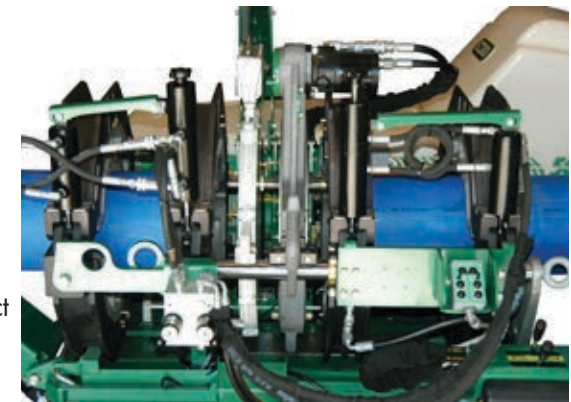
TX02003-4-24-02

Carriage Assembly

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

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

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



PH04794-10-15-12

TX04472-10-24-12

Overview

Facer

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

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



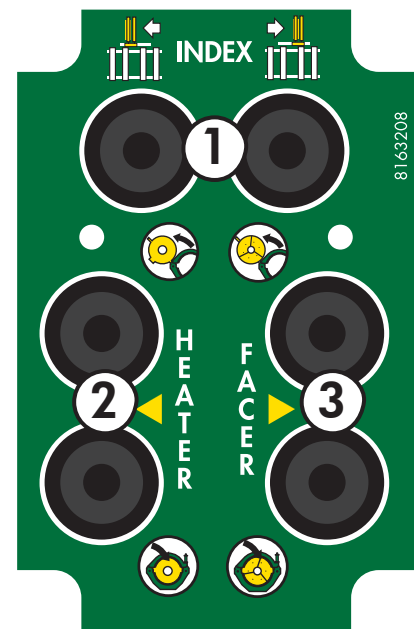
PH04741-10-8-12

TX04473-07-28-17

Indexer Controls

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

- 1 Controls the movement of the indexer to the left and right.
- 2 Controls the movement of the heater, moving the heater in and out of the carriage.
- 3 Controls the movement of the facer, moving the facer in and out of the carriage.



CD01037-10-1-12

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



PH04814-10-24-12

TX04474-10-24-12

Overview

Heater

⚠ DANGER

This heater is not explosion proof. Operation of heater in a explosive atmosphere without necessary safety precautions will result in explosion and 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.

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

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

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

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

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

GFCI Operation and Testing

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

⚠ WARNING

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

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



PH04796-10-15-12



PH04732-10-1-12



PH04813-10-24-12



PH04773-10-1-12

Overview

Diesel Engine

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

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 less than 10 PSI 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.

TX05316-07-28-17



PH04090-10-24-10

Hydraulic Fluid Reservoir

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

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

TX01467-07-28-17



PH01251-1-29-98

Hydraulic Fluid Filter

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

TX01893-02-27-14



PH02000-1-15-01

Hydraulic Clamping

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

TX04476-10-24-12

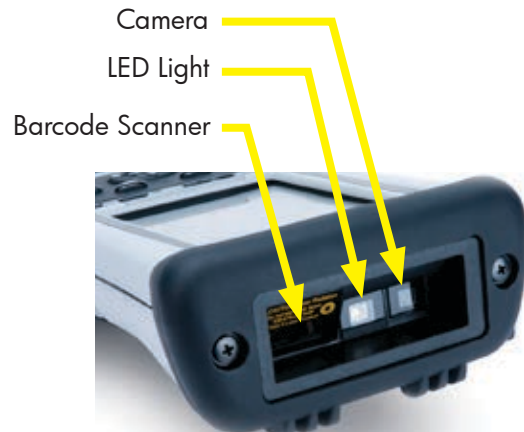
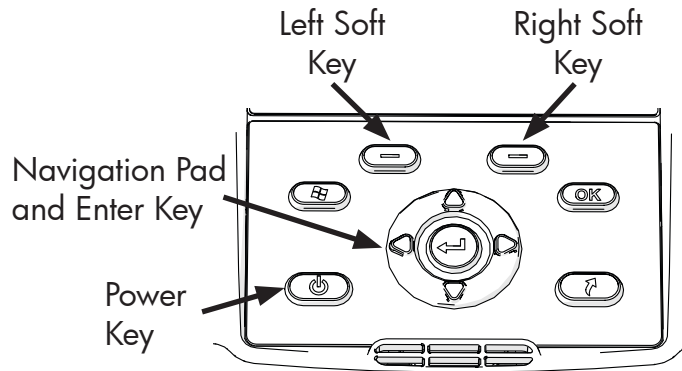
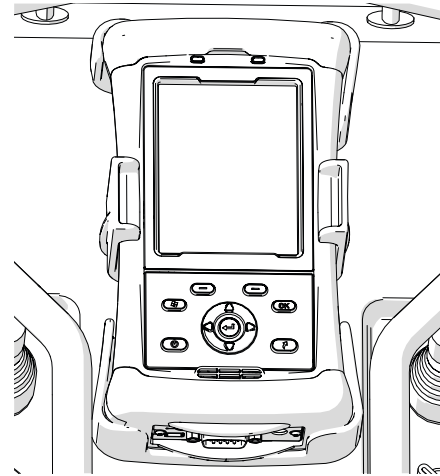
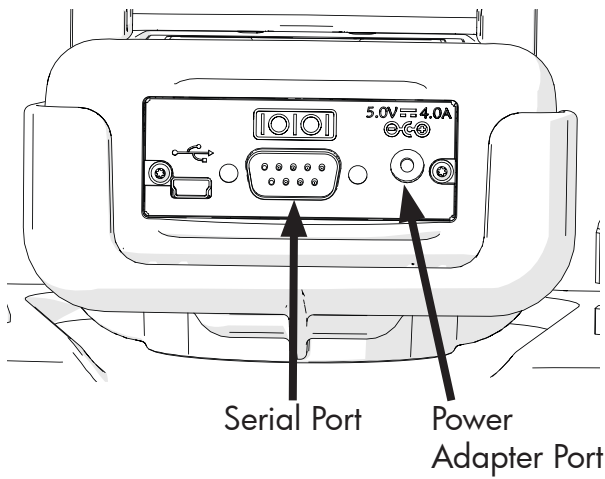


PH04027-3-2-10

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.



CD01709-06-06-16

CD01244-06-24-14

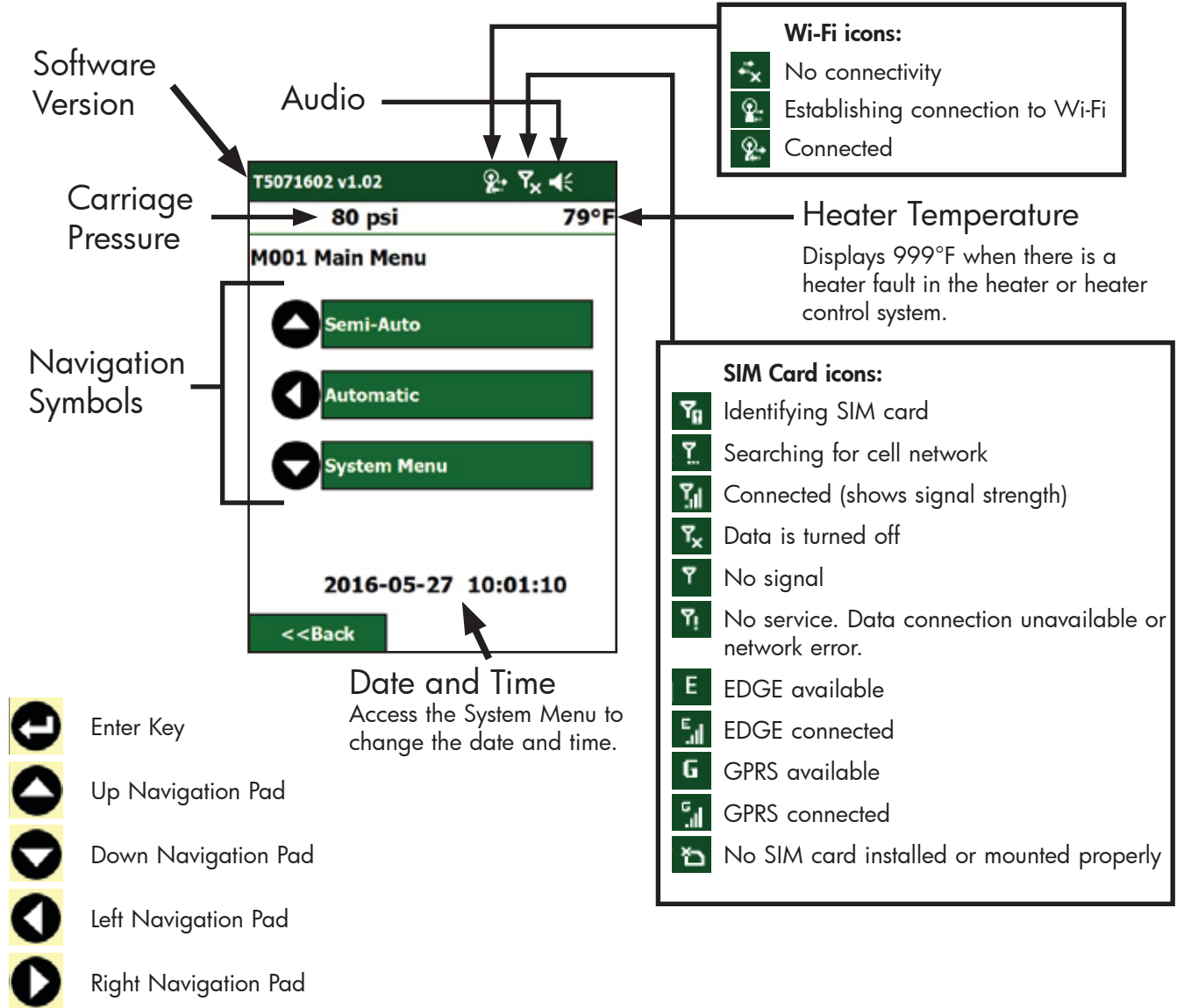
CD01245-06-24-14

PH04965-10-22-13

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 gauges.

Pipe Specifications		
Pipe Material	PIE710	
PIE SIZE	4" IS	
Wall Thickness	08 13.3	

Pressure		
Chop 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.



Stop-1228-95

TX00401-9-15-94

Check Hydraulic Fluid Level

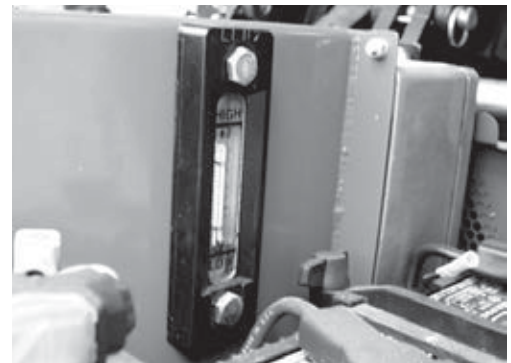
Check fluid level in sight gauge on reservoir and add hydraulic fluid if necessary.

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

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 fluid from an unopened container.



PH01251-2298

TX01450-07-31-17

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.

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

Turn the key and start the engine.

Confirm that all gauges read correctly.

Turn the key to OFF to stop the engine.



PH04790-10-8-12

TX02377-07-91-17

Operation - General

Moving Machine Into Position

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

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

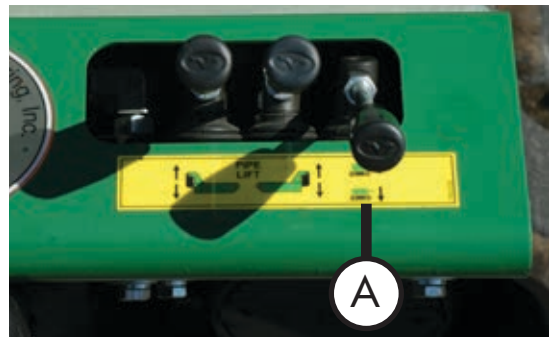
The track speed valve (A) is used to switch between low speed/high torque and high speed/low torque. The machine will not have torque available to turn in all conditions in high speed.



PH02290-4-17-02



TX04477-10-24-12



PH04730-10-1-12

Prepare Heater



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

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.

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

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



PH04796-10-1-12



PH04789-10-8-12

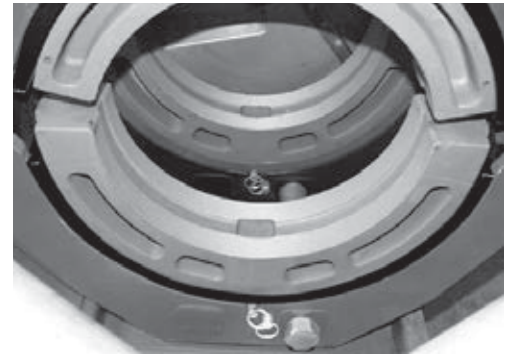
TX04478-08-01-17

Operation - General

Install Clamping Inserts

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

TX00368-9-15-94



PH0283-4-202

Set up Pipe Supports

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

TX00367-9-15-94



PH01264-2-12-98

Loading Pipe into Machine

Clean the inside and outside of pipe ends that are to be fused.
Open the upper jaws and insert pipe in each pair of jaws with applicable inserts installed.
Let the pipe ends protrude more than 1" past the face of the jaws.

TX01094-8-20-96



PH04781-10-8-12

Positioning Pipe into Machine

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

TX04479-10-24-12



PH04782-10-8-12

Operation - General

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:

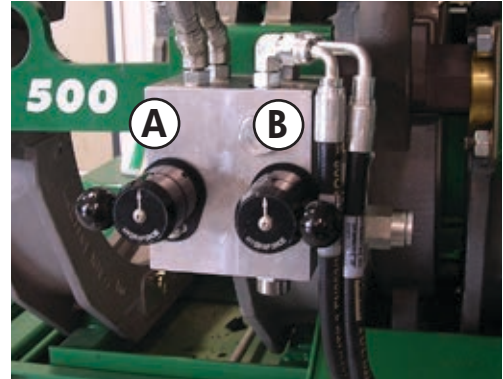
Push the cylinder tie bar toward the jaws until cylinders are vertical.

Rotate the valve knob down to clamp.

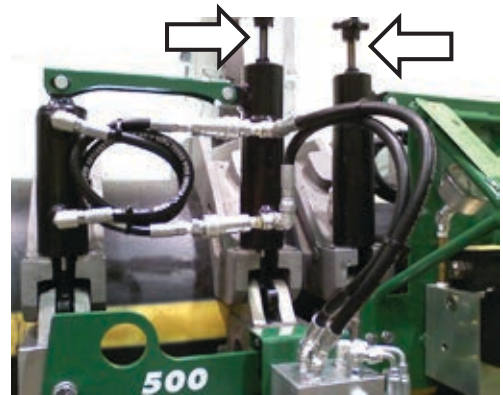
Hi/Lo adjustment:

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

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.



PH04058-3-2-10



PH04059-3-2-10

Operation - General

Begin Facing

Turn facer on with the switch on the fusion control pendant (A).

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

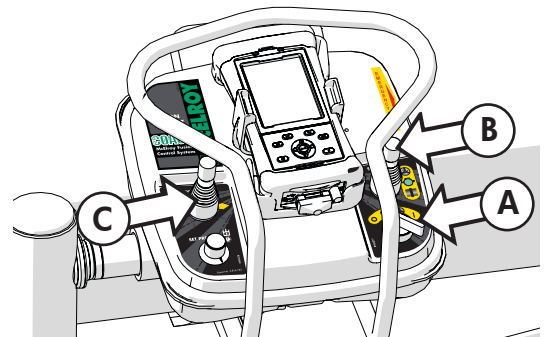
The facing pressure should be set as low as possible while still facing pipe. Excessive facing pressure can damage the facer. It may be necessary to adjust the facing pressure.

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.

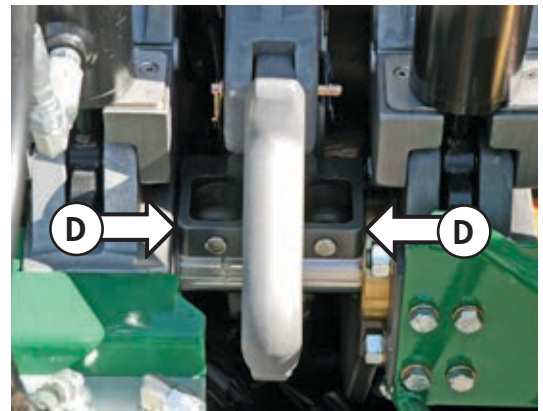
Move the carriage directional control (C) to the left to close the carriage and begin facing. Continue facing the pipe until the rest buttons on the jaws contact the facer rest stops (D) on both the fixed jaw and movable jaw sides.

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

Turn facer off (A).



CD01859-1-1-16-16



PH04736-10-2-12

TX05317-08-01-17

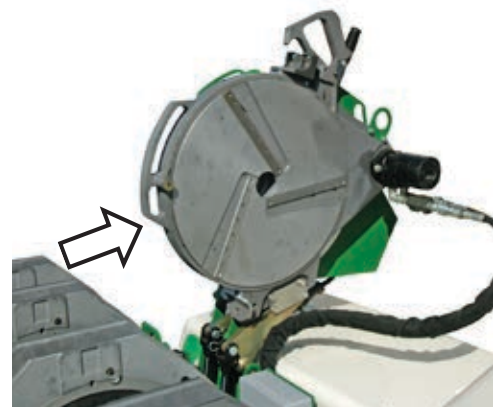
After Facing

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. Pivot facer to the out position.

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.



PH04741-10-24-12

TX05318-08-01-17

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 noticeable step across the joint, adjustments must be made.

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

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

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

Hi/Lo adjustment:

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

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

Repeat adjustment until pipe is aligned.

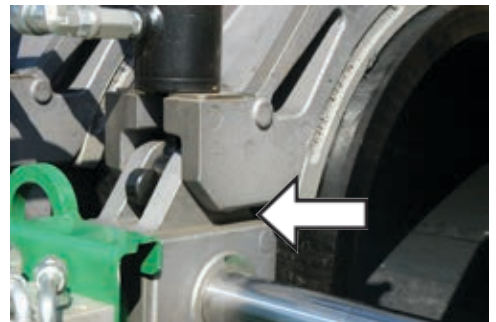
NOTICE: When clamping, do not over-adjust the clamping force because machine damage can result. Check to see if there is space between the upper and lower jaws. If the two jaws are touching, do not continue to tighten.

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

TX04482-10-24-12



PH04737-10-2-12



PH04742-10-8-12

Check Heater Temperature

⚠️ 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.

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

⚠️ 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.

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.

TX05065-06-28-16



WR00077-4-16-93

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 fusion operations.

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

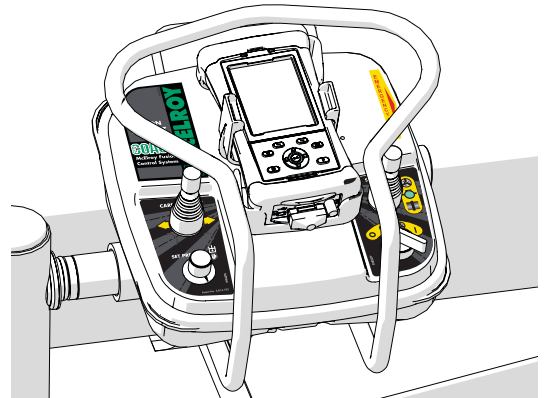
Semi-Auto Fusion: The operator performs all fusion operations.

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

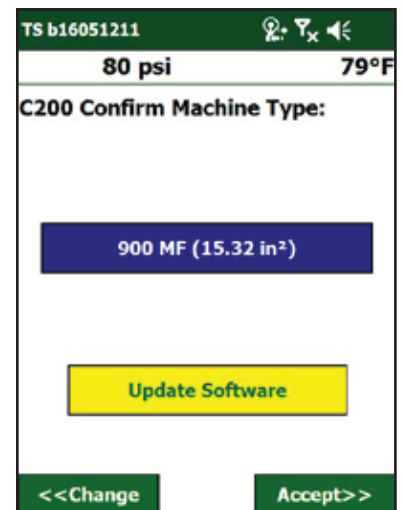
Confirm Machine Type:

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

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.



CD01859-11-16-16



PH05516-06-06-16

TX05102-07-07-16

Operation - Auto Fusion

Auto Fusion

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

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

Main Menu:

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

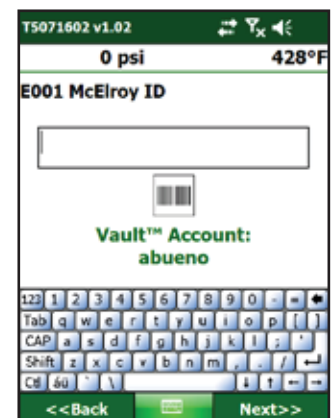
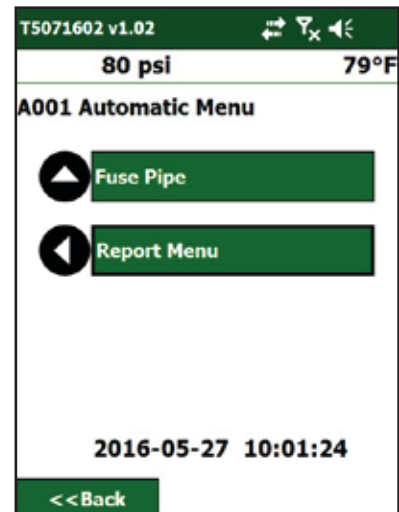
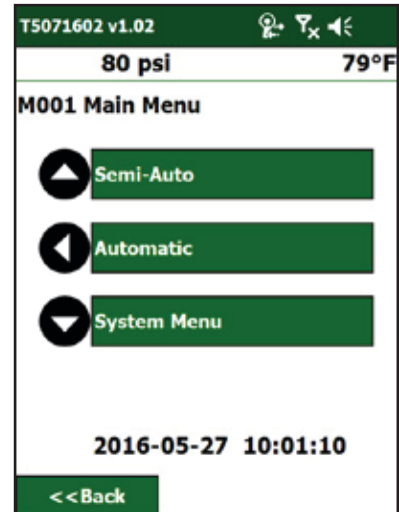
Automatic Menu:

- **Fuse Pipe** - Proceed with fusion process.
- **Report Menu** - View joint report, send joint reports, or access 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.

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.

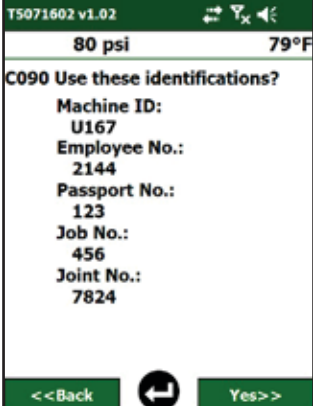
- Press  to change the identifications (System password may be required).
- Tap **Yes>>** to proceed with these identifications and proceed to "Parameters".

To Change the Identifications:

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

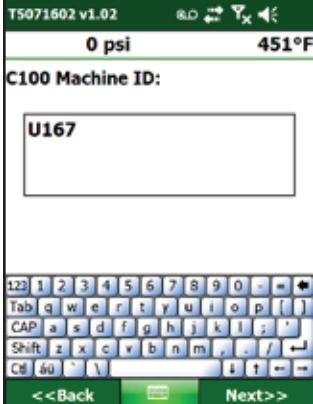
- Input an employee number.
- Tap **Enter>>**.

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



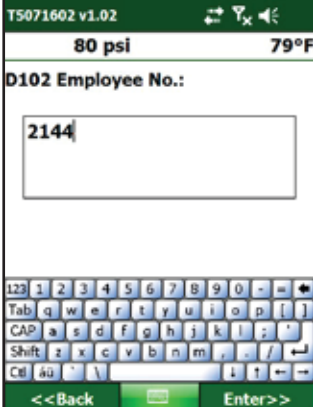
T5071602 v1.02 80 psi 79°F
C090 Use these identifications?
Machine ID:
U167
Employee No.:
2144
Passport No.:
123
Job No.:
456
Joint No.:
7824
<<Back Yes>>

PH05535-06-30-16




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 Alt Enter
<<Back Next>>

PH05620-07-15-16



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 Alt Enter
<<Back Enter>>

PH05536-06-04-16



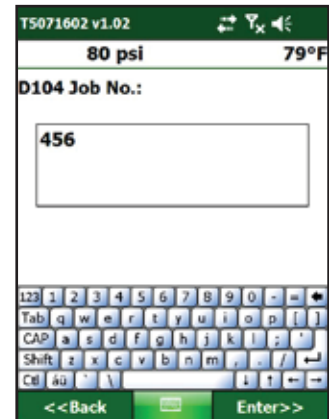
T5071602 v1.02 80 psi 79°F
D103 Passport No.:
123
123 1 2 3 4 5 6 7 8 9 0 - = *
Tab q w e r t y u i o p []
CAP a s d f g h j k l ; ' :
Shift z x c v b n m , . / < >
Ctrl Alt Enter
<<Back Enter>>

PH05537-06-06-16

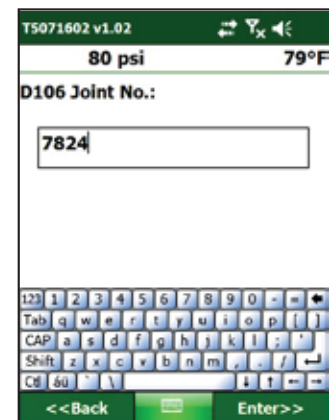
Operation - Auto Fusion

Auto Fusion (continued)

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




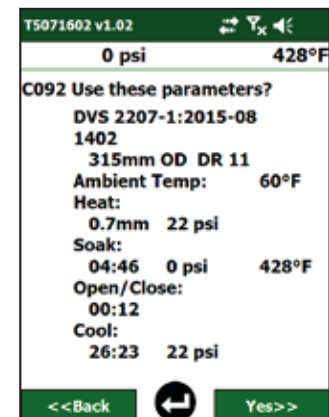
- Input a joint number.
- The joint number will increment up as fusion joints are completed.
- Tap **Enter**>>.



Parameters:

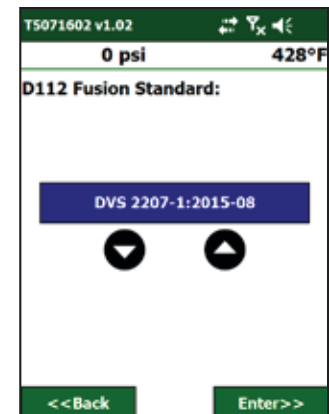
Confirm if the parameters listed are correct. These parameters will be displayed in the joint report.

- 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**>>.



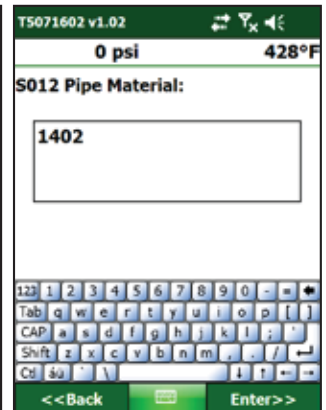
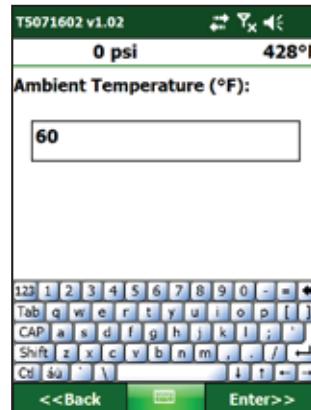
Operation - Auto Fusion

Auto Fusion (continued)

- Input the ambient temperature.

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

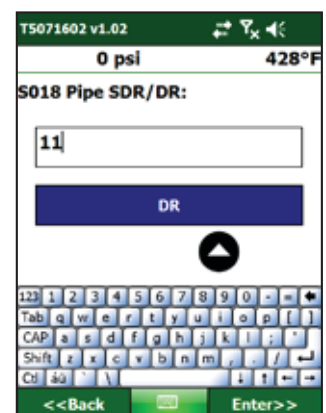
- Input the pipe material.
- Tap **Enter>>**.



- 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>>**.

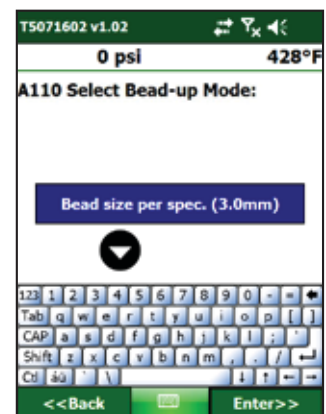


- Use the up/down arrows to select the bead-up mode and input values.

The bead-up mode can be entered by:

- time (in minutes and seconds)
- displacement (in millimeters)
- bead size per spec (0.0mm)

IMPORTANT: Entering a value will override the fusion standard parameter. 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:

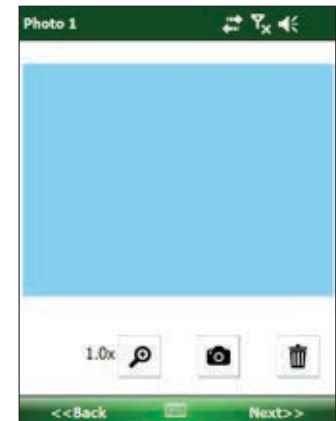
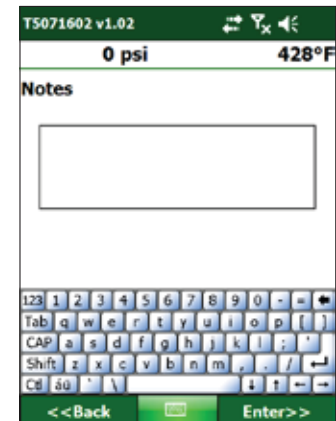
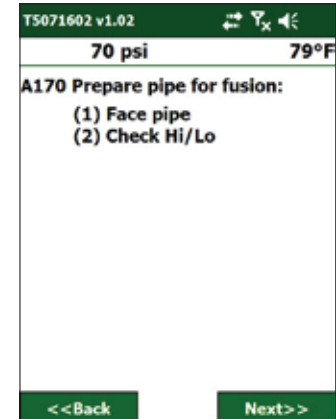
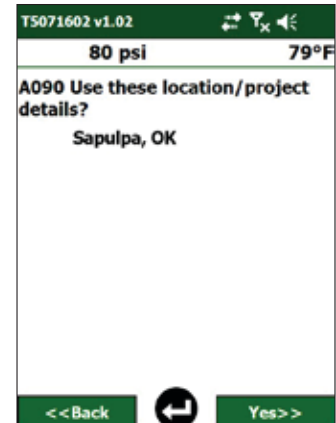
Refer to "Operation - General" section for details on pipe facing and Hi/Lo alignment check.

- 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.



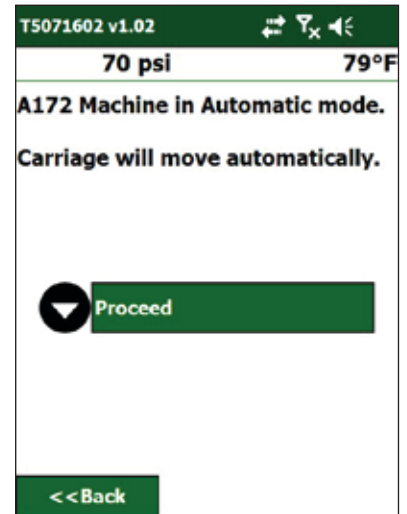
Operation - Auto Fusion

Auto Fusion (continued)

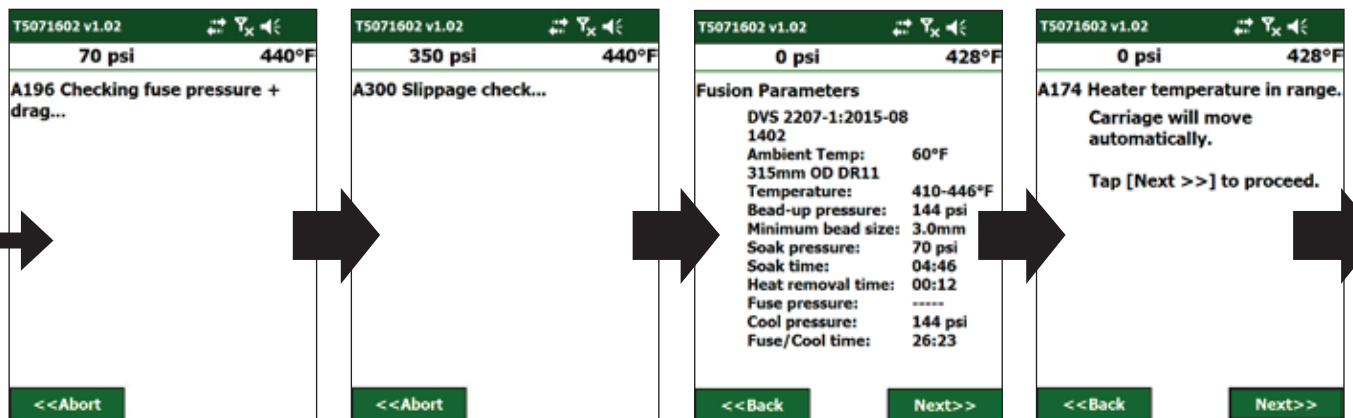
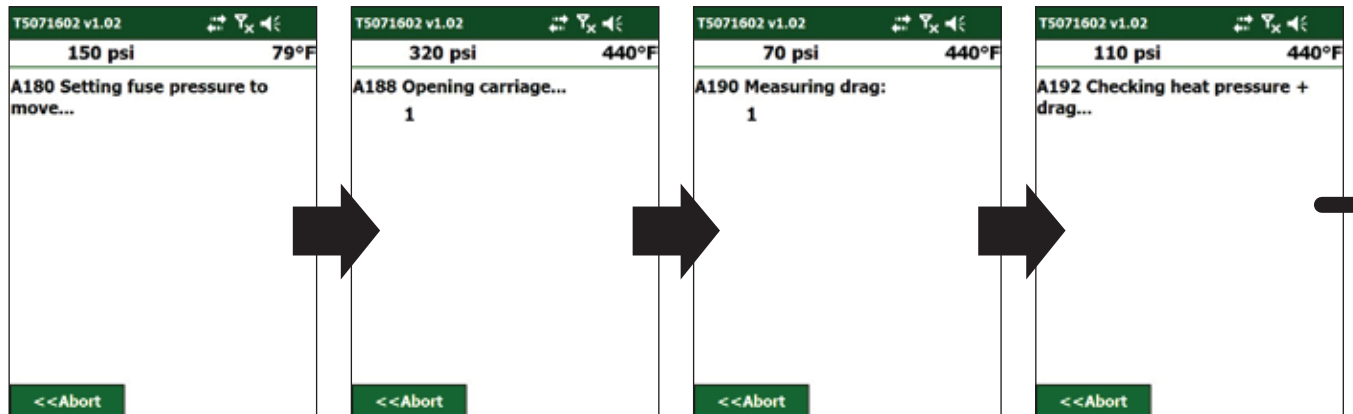
The automatic fusion operation will start and proceed through a series of screens. The carriage, indexer, and heater will move automatically.

⚠ 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 automatic 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.



PH05548-06-30-16



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)

The sequence shows the following steps:

- A202 Opening carriage...** (TS071602 v1.02, 330 psi, 440°F)
- A210 Installing heater...** (TS b16051211, 330 psi, 440°F)
- A212 Closing carriage...** (TS071602 v1.02, 330 psi, 440°F)
- A214 Heating pipe: (#7824)** (TS b16051211, 340 psi, 440°F). Includes instructions: "36" OD 21 DR. Use Up and Down Arrows to adjust cycle time. Time remaining: 00:02".

The sequence shows the following steps:

- A220 Soaking pipe: (#7824)** (TS071602 v1.02, 70 psi, 440°F). Includes instructions: "36" OD 21 DR. Use Up and Down Arrows to adjust cycle time. Time remaining: 00:18".
- A182 Opening carriage...** (TS b16051211, 2140 psi, 440°F, value 0)
- A230 Fusing pipe: (#7824)** (TS b16051211, 310 psi, 440°F). Includes instructions: "36" OD 21 DR. Use Up and Down Arrows to adjust cycle time. Time remaining: 00:20".

After the fusion joint, the joint notes appear.

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

The Joint Report screen displays a "Notes:" field with a scroll bar. Below the field is an "Append Notes..." button. At the bottom are "<<Back" and "Next>>" buttons.




PH05621-07-15-16

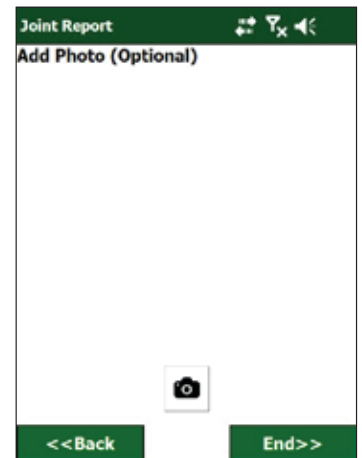
Operation - Auto Fusion

Auto Fusion (continued)

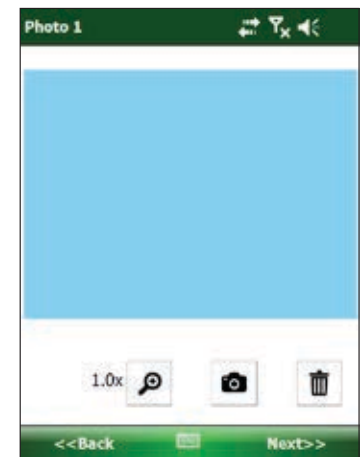
Add Photo: - Add an optional photo of the fusion joint to the joint report.

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.



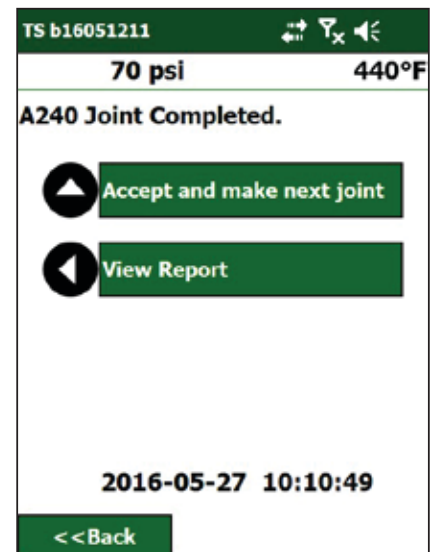
PH05571-06-30-16



PH05572-06-30-16

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. The joint completed menu appears.

- **Accept and make next joint** - Accept the fusion joint and proceed to next joint.
- **View Report** - View the joint report of the completed fusion joint.



PH05566-06-30-16

Operation - Auto Fusion

Auto Fusion (continued)

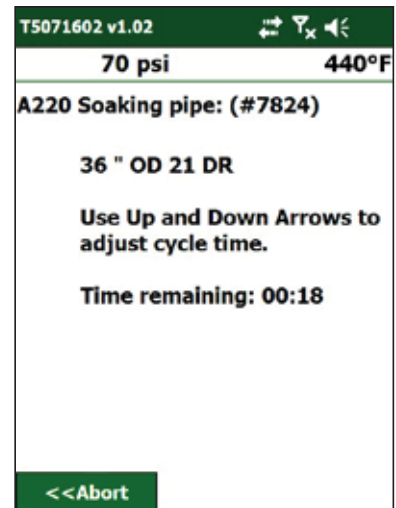
Create Dummy Joint (Optional):

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.

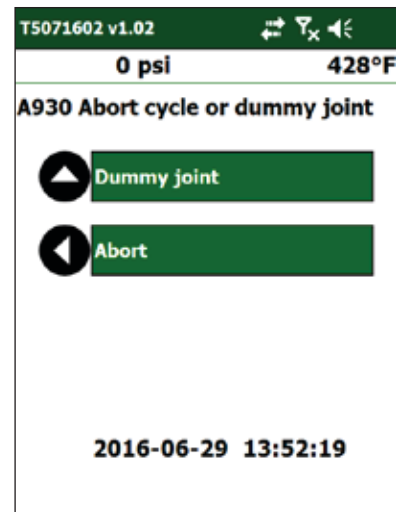
- Tap **Dummy Joint** to continue the automatic fusion operation performing a dummy joint.
- Tap **Abort** to stop the automatic fusion operation.

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

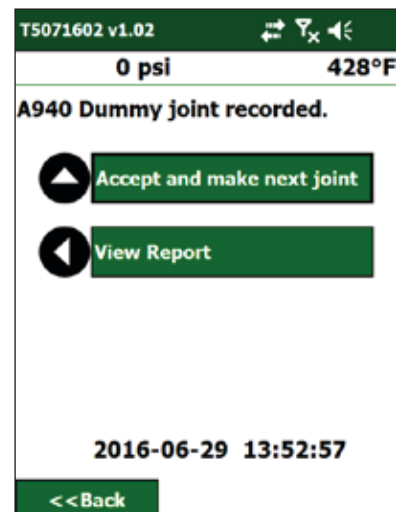
- **Accept and make next joint** - Accept the recorded joint and proceed to next joint.
- **View Report** - View the recorded joint report. The joint status in the report will list a status of Dummy Joint.



PH05662-07-16



PH05604-06-29-16



PH05603-06-29-16

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, or failed.
- 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>>

PH0556706-30-16

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>>

PH0556806-30-16

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

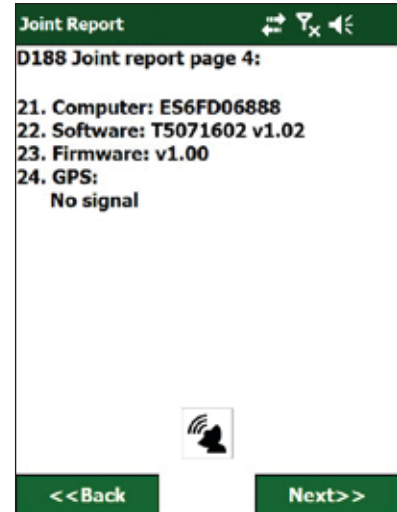
<<Back Next>>

PH0560706-30-16

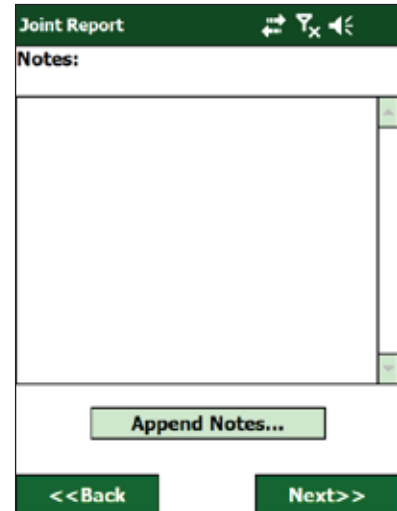
Operation - Auto Fusion

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.






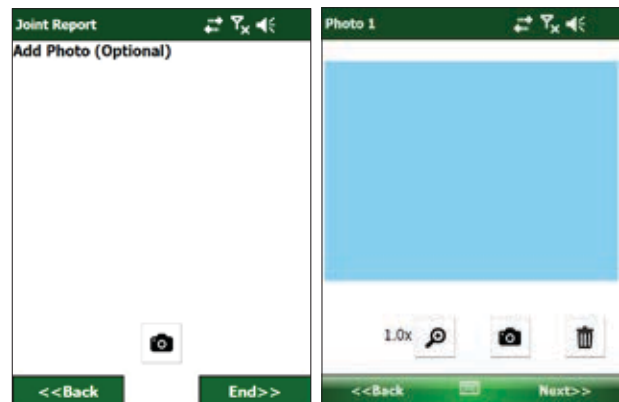
- Append the previously entered notes with any additional information about the fusion joint.



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

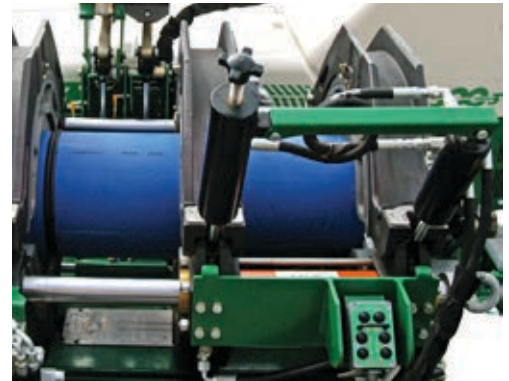
Opening Movable Jaws

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

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

Open the movable jaws.

TX04486-10-24-12



Opening Fixed Jaws

Open the fixed jaws.

TX00381-9-16-94



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



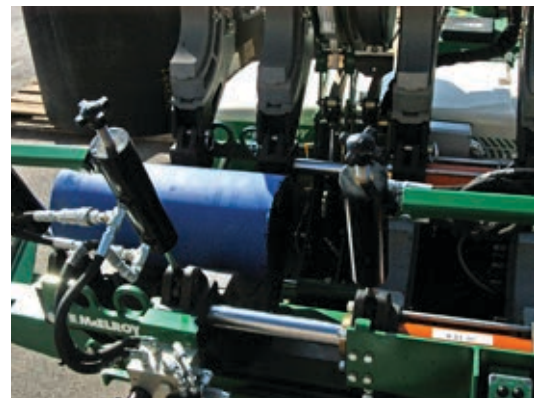
Position Pipe for Next Joint

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

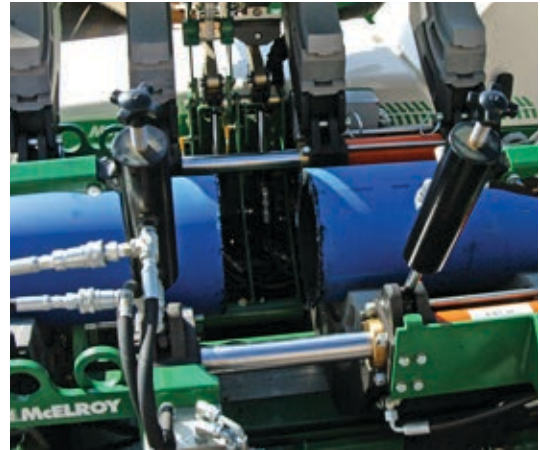


Operation - Auto Fusion

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.

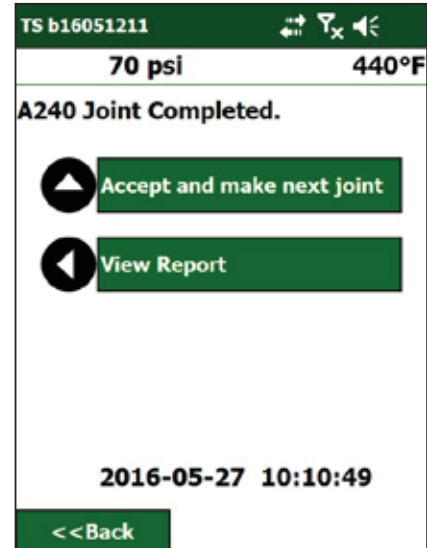


PH04781-10-8-12

TX00384-04-18-16

Make Next Joint

Tap **Accept and make next joint** to accept the completed fusion joint and start a new fusion joint. The next joint can be fused using the same parameters and information or use new parameters.



PH05566-06-30-16

TX05068-06-28-16

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).

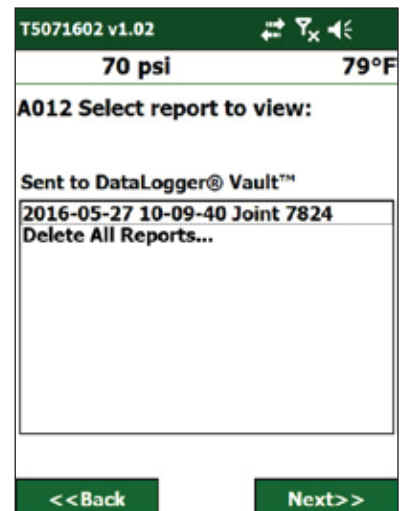
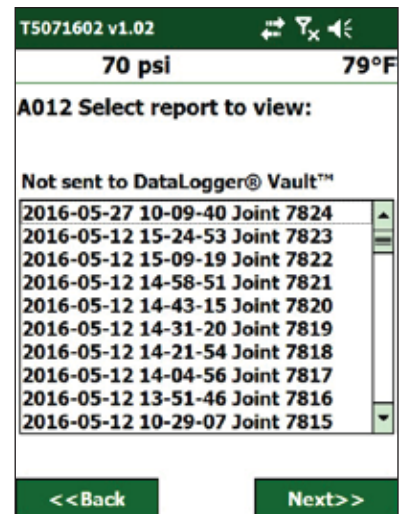
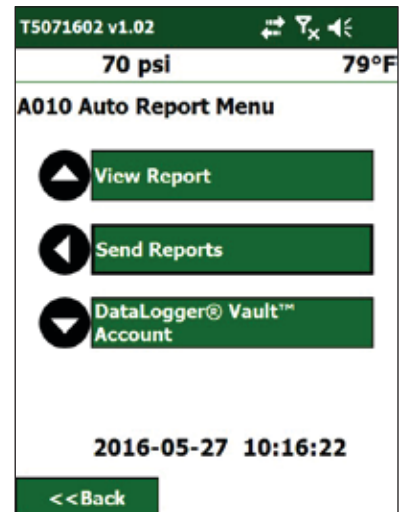
View Report

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.

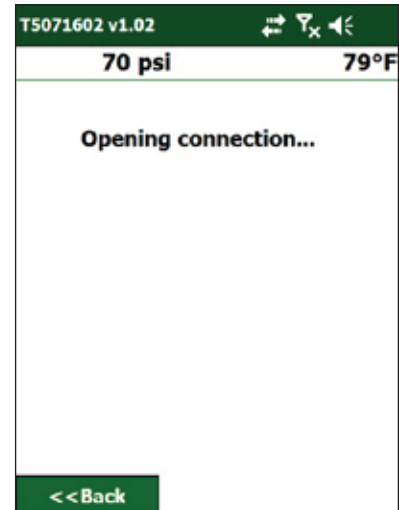


Operation - Auto Fusion

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

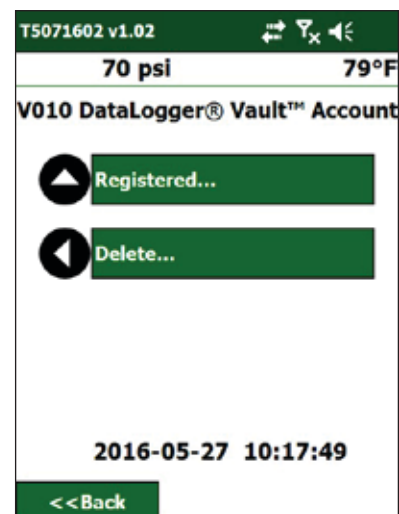
Selecting DataLogger Vault Account displays a screen with two options:

- **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.



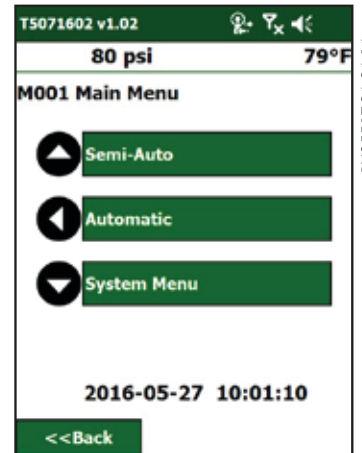
Operation - Semi-Auto Fusion

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.

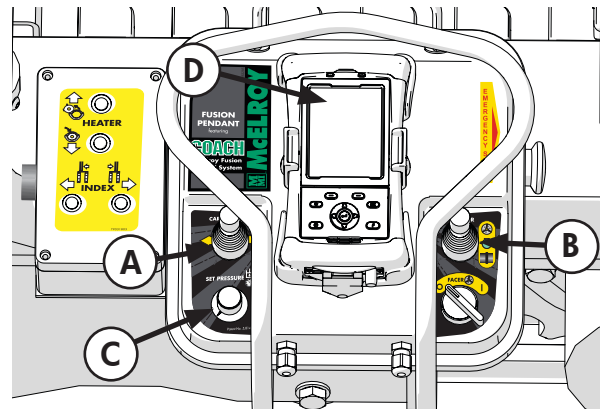


TX05070-07-07-16

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 - Carriage Pressure Gauge

TX05071-07-07-16

Set Pressures

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

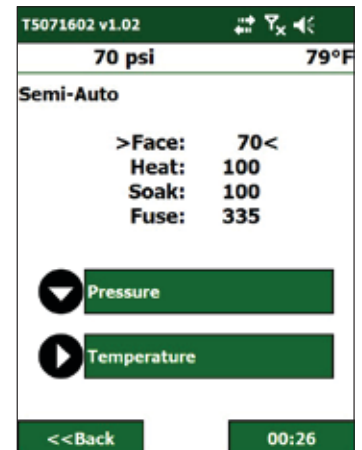
The theoretical fusion pressure can be determined using the fusion pressure calculator that is supplied with the machine or by using the McCalc® app is available for iOS, Android, Windows Phone and PC devices. The fusion pressure can also be determined by referring to the section Determining Fusion Pressure.

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.



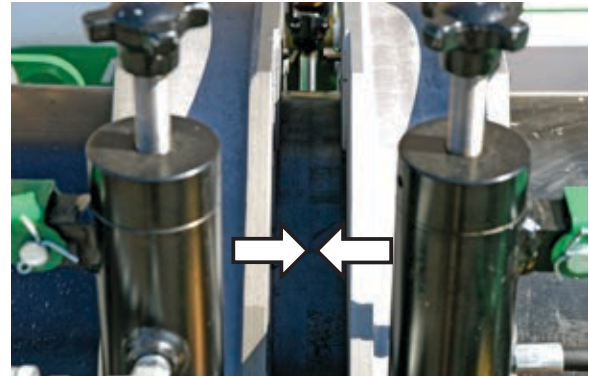
TX05072-04-06-17

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**.



PH04737-10-8-12

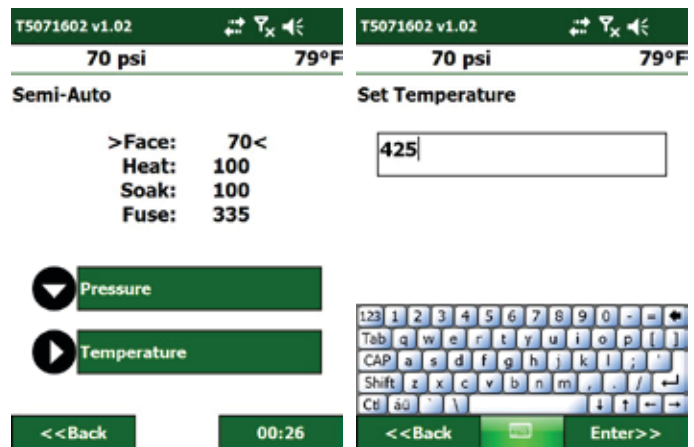
TX00971-04-18-16

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.



PH05669-04-13-17

PH05670-04-13-17

TX05293-04-13-17

Carriage Indexer Heater Position

Open the carriage completely.

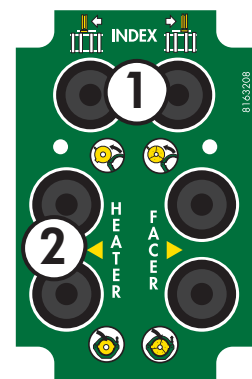
Actuate the index buttons (1) to position the heater between the pipe ends.

Pivot the heater between open pipe ends by pressing the heater valve button (2) to the **IN** position.

NOTICE: Ensure proper heater clearance from pipe and jaws before pivoting heater in.



PH04785-10-8-12



CD01037-10-1-12

TX05319-08-01-17

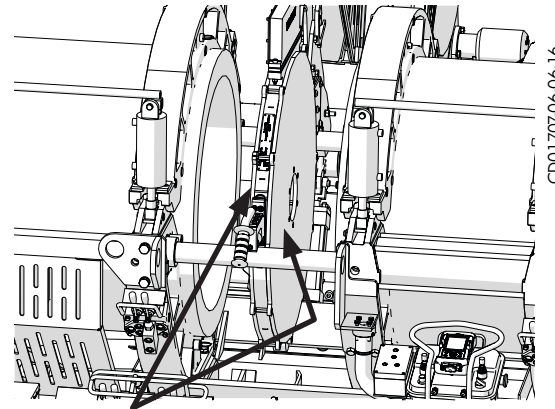
Operation - Semi-Auto Fusion

Cleaning Heater

⚠ 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.

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



**Clean Heater
Surfaces**

CD01707-06-06-16

Operation - Semi-Auto Fusion

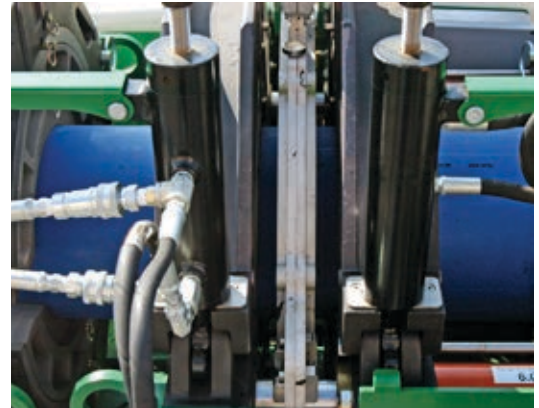
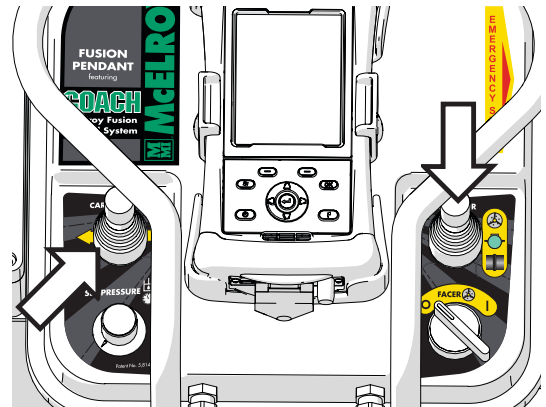
Heat Pipe

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.



TX05076-07-07-16

Fusing the Pipe

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

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

Open the carriage just enough to remove the heater.

Index the heater to the right to clear the pipe ends. Actuate the heater pivot button for the **OUT** position to quickly pivot heater out.

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.



TX05077-07-07-16

Operation - Semi-Auto Fusion

Opening Movable Jaws

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

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

Open the movable jaws.

TX04486-10-24-12



PH04788-10-8-12

Opening Fixed Jaws

Open the fixed jaws.

TX00381-9-16-94



PH04788-10-8-12

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



PH02301-4-17-02

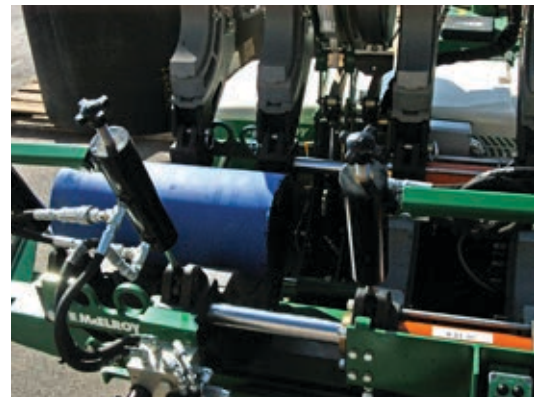
Position Pipe for Next Joint

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



PH04780-10-8-12

Operation - Semi-Auto Fusion

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



PH04781-10-8-12

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.

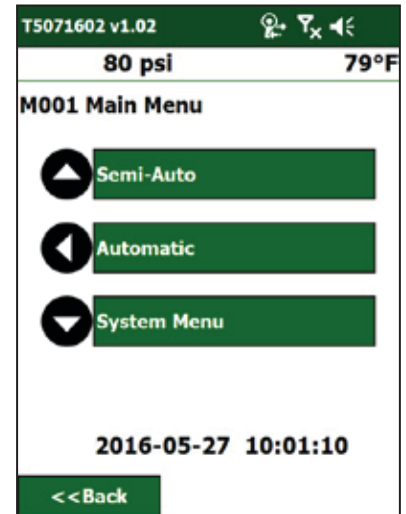
Tap **System Menu** to make changes to the fusion control software.

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

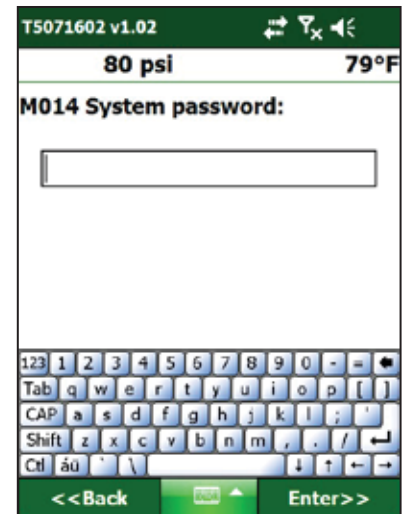
The default system password is **123**.

System Menu (1):

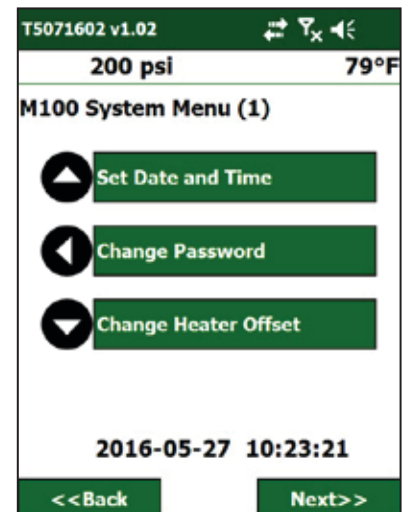
- **Set Date and Time** - Change the date and time for the computer.
- **Change Password** - Change the password, the current password is needed to make a change.
- **Change Heater Offset** - Adjust the heater temperature offset.



PH0551706-06-16



PH05523-06-06-16



PH05518-06-06-16

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.

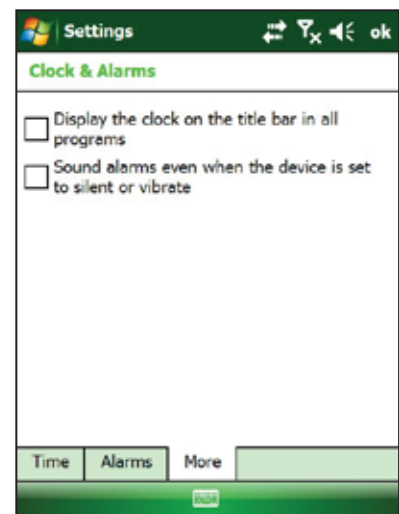
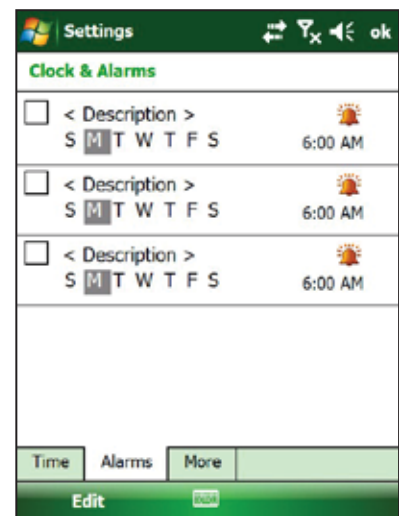
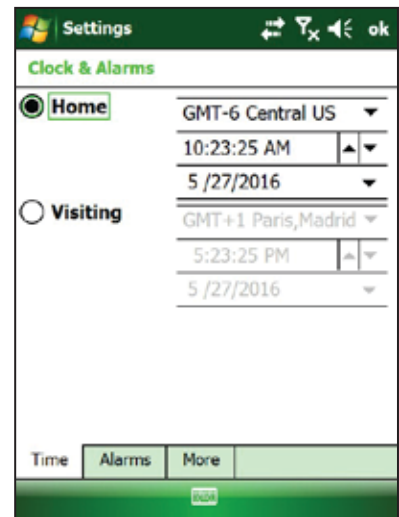
The operator can set 3 different alarms. Set the different days of the week and the time the alarm is to sound.

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)

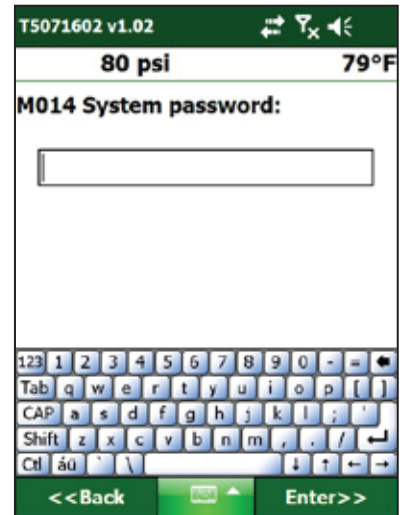
Change Password:

To change the password:

Input the current system password.

The default system password is **123**.

Tap **Enter>>**.



PH05523-06-06-16

Input the new system password.

Tap **Enter>>**.



PH0552706-06-16

Re-input the new system password.

Tap **Enter>>**.



PH05528-06-06-16

System Menu

System Menu (1) (continued)

Change Heater Offset:

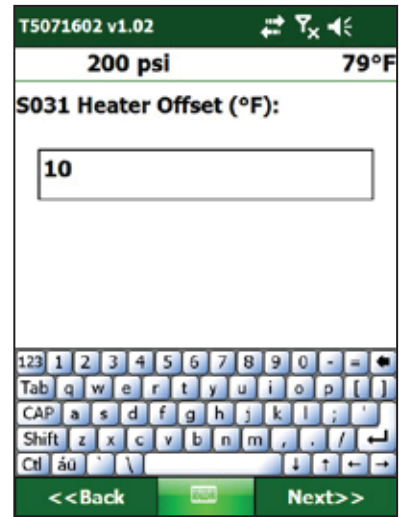
Input the measured offset value in degrees:

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.

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

Tap **Next>>**.

TX05079-07-07-16



System Menu (2)

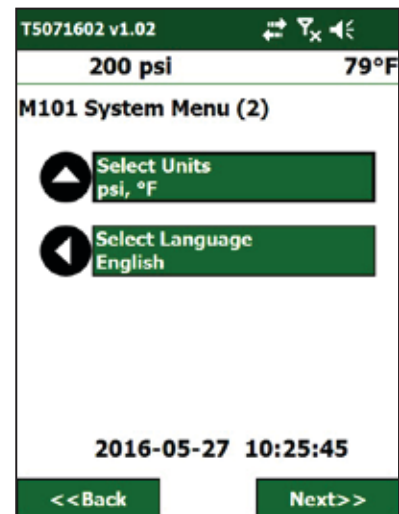
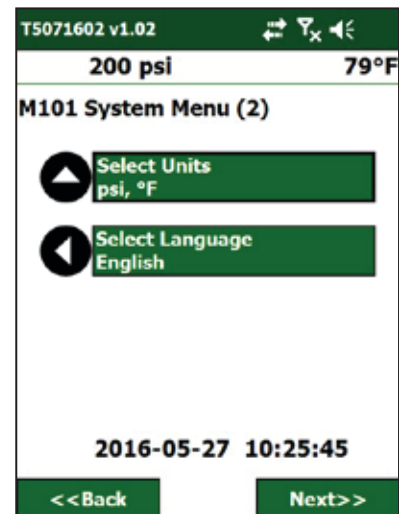
Select Units:

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.

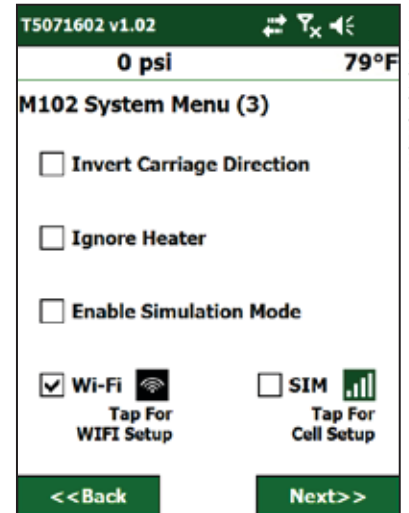
TX05080-06-28-16



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

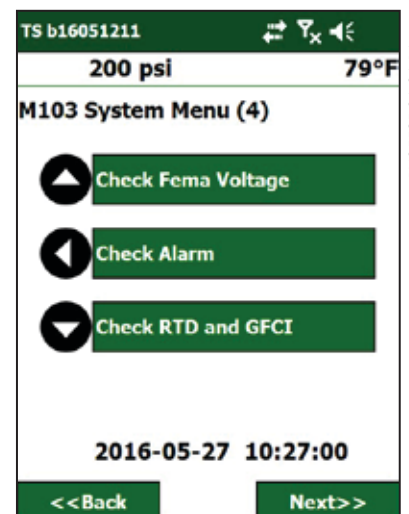
SIM connection icons:

- 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

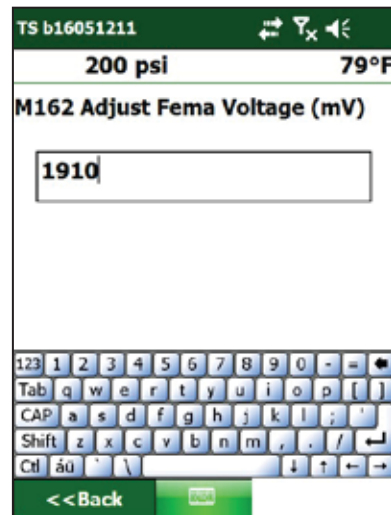
System Menu (4) (continued)

Check Fema Voltage:

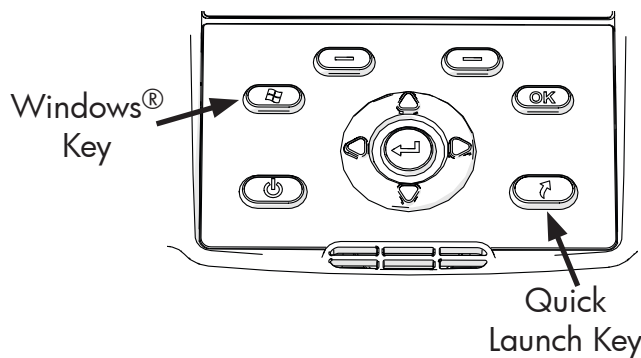
The FEMA pressure valve voltage can be temporarily changed for testing and troubleshooting purposes. The voltage is entered in millivolts (mV). Setting the voltage will show a response in the hydraulic pressure. Enter a value between 1000mV to 10,000mV.

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

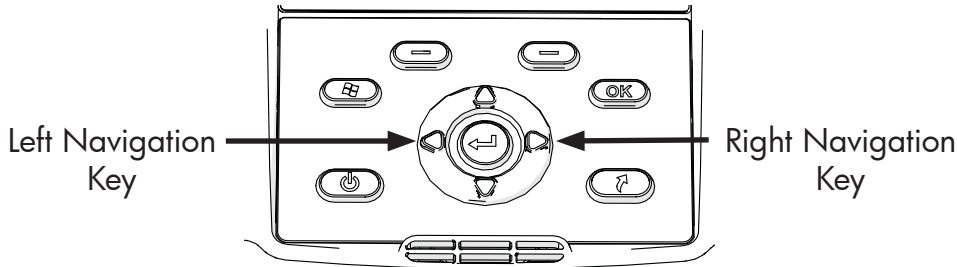
System Menu (4) (continued)

Check RTD and GFCI:

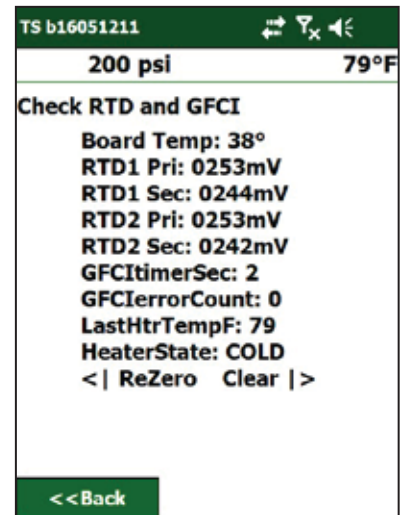
Check values for the RTDs and GFCI.

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

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



TX0508206-28-16



PH0553306-06-16

CD01245-06-30-16

System Menu (5)

Update Software:

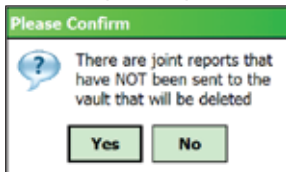
Updates the software if there is a newer version available (a data connection is required to update). The update will be downloaded and installed automatically.

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

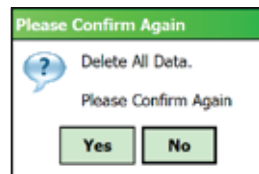
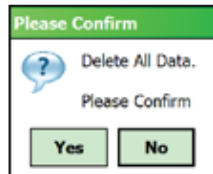
Delete All Data.:

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.

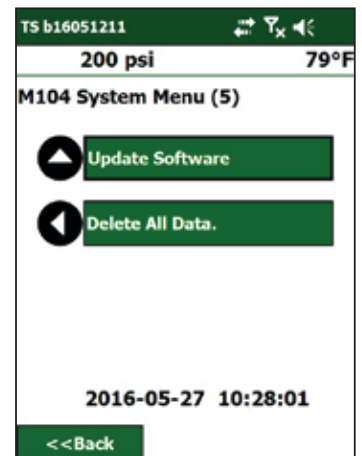


You will be asked to confirm the deletion of all data. Confirm **Yes** or **No**. Then you will be asked to confirm one more time.



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

TX0529204-12-17



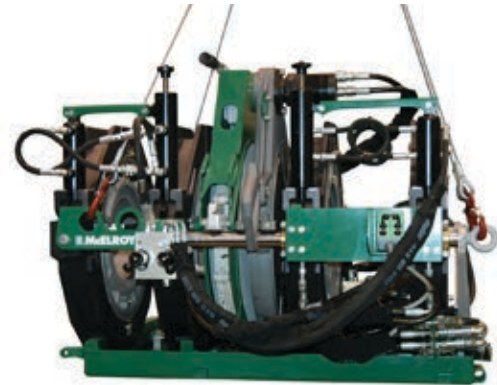
PH0553306-06-16

Special Operation

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.



PH04774-10-24-12

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.
- 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.
- 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

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

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

⚠ 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.

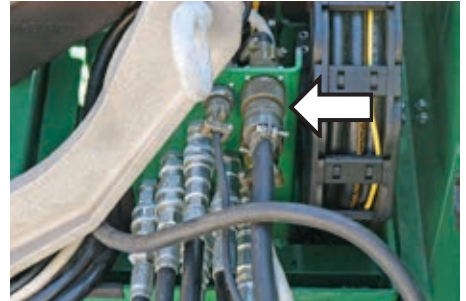
To remove the carriage, pull the pin at the rear of the machine and slide the carriage forward approximately one inch.

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

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

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

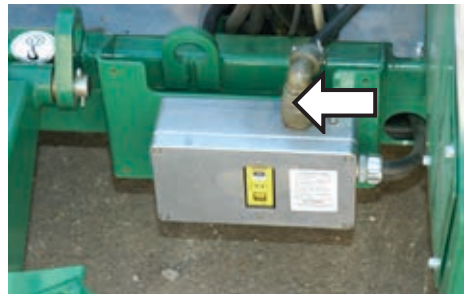
Connect the extension cable to the control pendant and to the existing cable on the pendant arm.



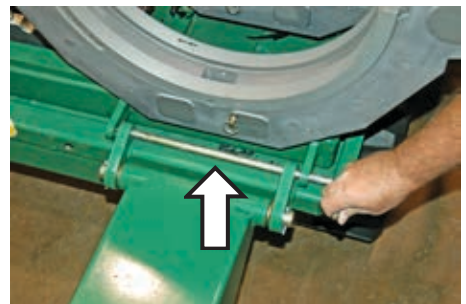
PH04770-10-8-12



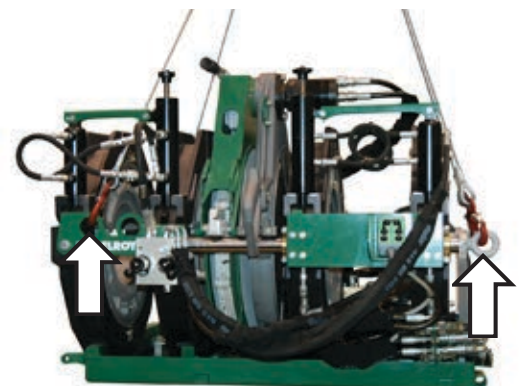
PH04775-10-8-12



PH04773-10-8-12



PH04762-10-8-12



PH04774-10-24-12

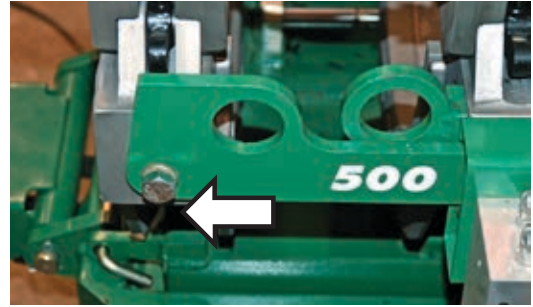
Special Operations

3-Jaw Carriage Removal

Carriage Removal

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

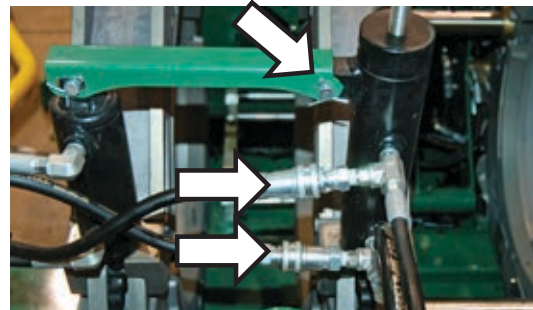
Remove the outer fixed jaw braces.



PH04743-10-8-12

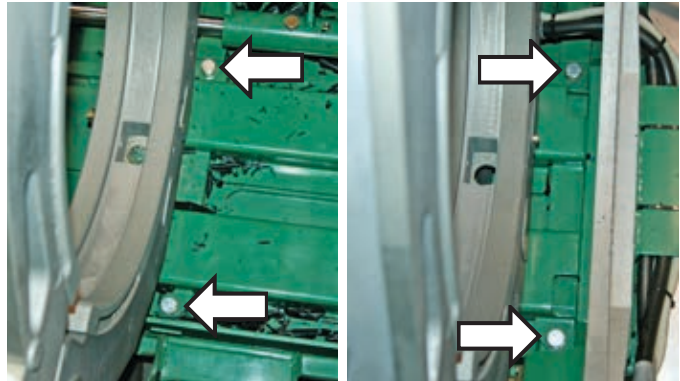
Remove the pin that connects the cylinder tie bar on the inner clamp cylinder. Rotate the tie bar away from the inner clamp cylinder.

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



PH04744-10-8-12

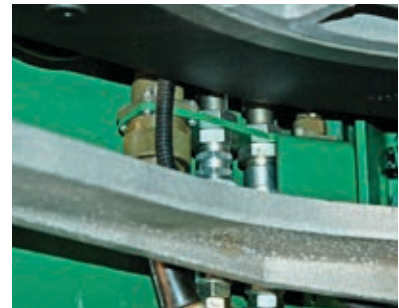
Remove the four bolts that attach the 3-Jaw skid to the 4-Jaw skid.



PH04746-10-8-12

PH04747-10-8-12

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



PH04778-10-19-12

Disconnect the hydraulic hoses connecting the hydraulic clamping.



PH04775-10-19-12

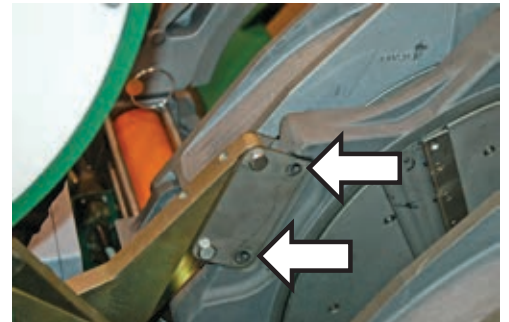
The 3-Jaw skid can now be lifted out of the 4-Jaw skid leaving the outer fixed jaw behind.

Special Operations

3-Jaw Carriage Removal (continued)

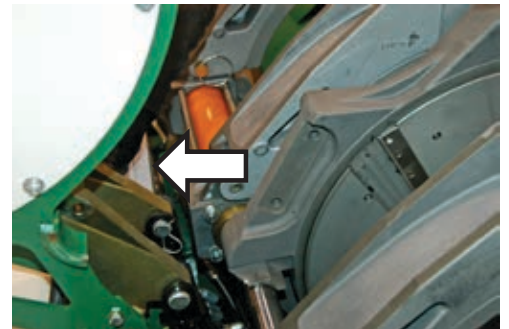
Remove the Facer:

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



PH04752-10-8-12

Rotate the facer pivot arm away from the facer.



PH04754-10-8-12

Disconnect the facer hydraulic hoses.



PH04776-10-19-12

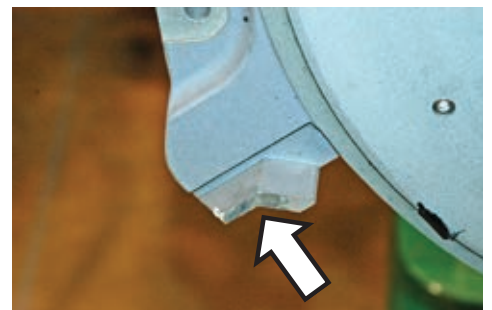
Attach a lifting sling to the lift point on the facer and lift the facer from the carriage.



PH04777-10-8-12

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

Remove the two bolts that hold the bracket in place.

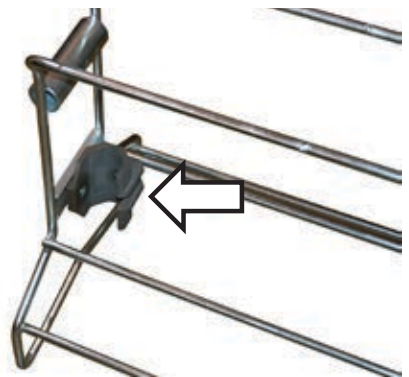


PH04758-10-8-12

Special Operations

3-Jaw Carriage Removal (continued)

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



PH04759-10-8-12

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



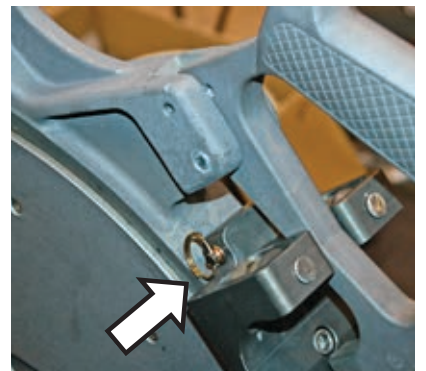
PH04760-10-8-12

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



PH04761-10-8-12

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



PH04811-10-8-12

PH04812-10-8-12

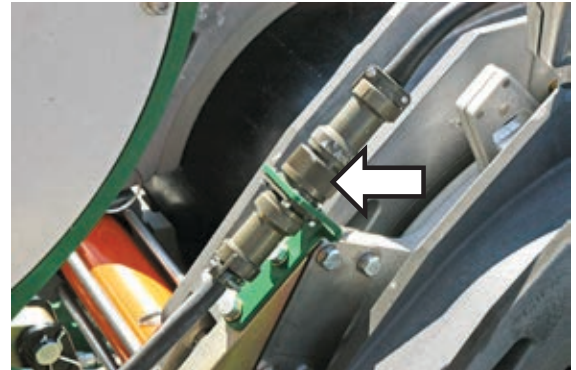
Special Operations

3-Jaw Carriage Removal (continued)

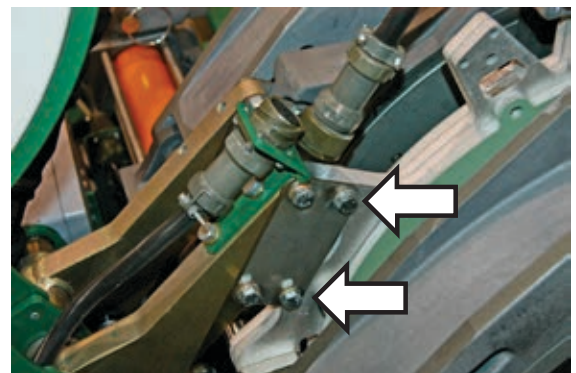
Remove Heater:

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

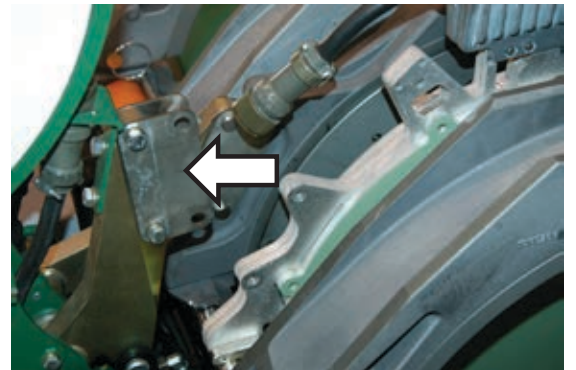
Disconnect the heater power cable on the top of the heater.



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



Rotate the heater pivot arm away from the heater.



Attach a lifting sling to the lift point on the top of the heater.
Lift the heater away from the carriage and place it into the heater stand.

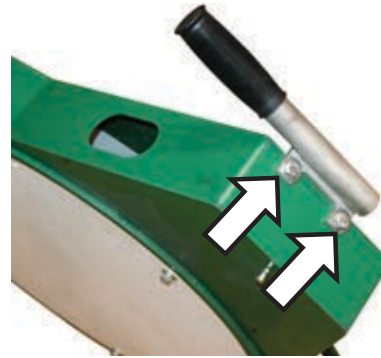


Special Operations

3-Jaw Carriage Removal (continued)

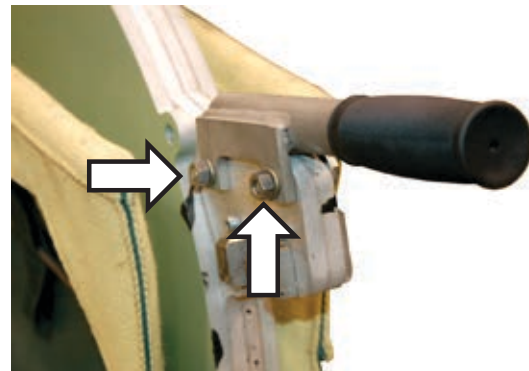
Install the heater handle and stripper bar:

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



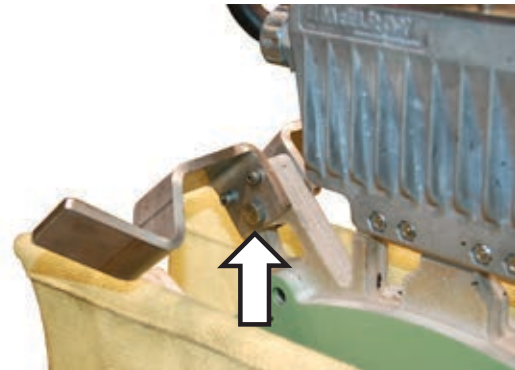
PH04797-10-8-12

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



PH04798-10-8-12

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

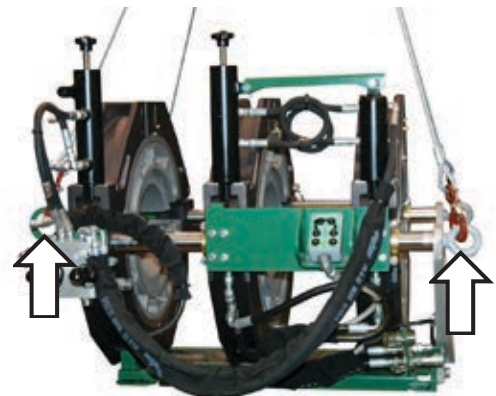


PH04799-10-8-12

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

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

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



PH04779-10-8-12

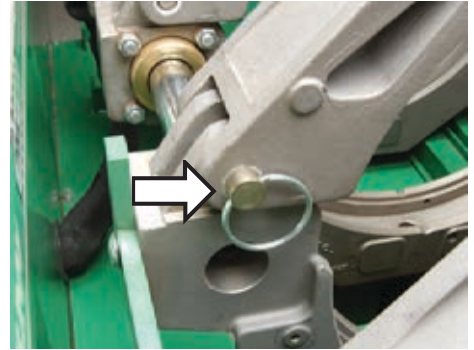
Special Operations

Remove Upper Jaws

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

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

TX04493-08-01-17

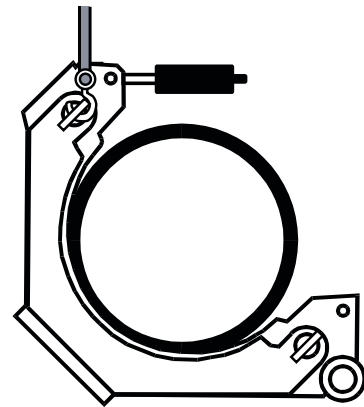


PH02284-4-17-02

Make Fusion Joint

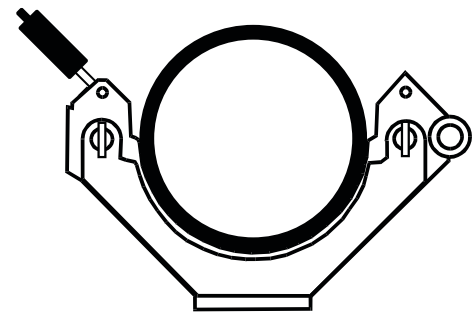
Clamp Carriage Assembly to Pipe

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



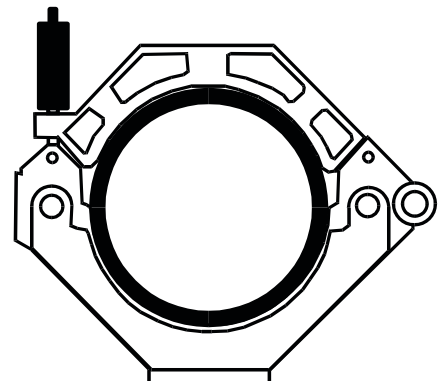
CD01038-10-8-12

Rotate carriage assembly around to a normal upright position.



CD01039-10-8-12

Attach the top jaws and clamp around pipe.



CD01040-10-8-12

Special Operations

Make Fusion Joint (continued)

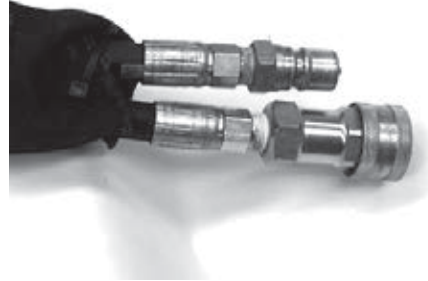
Attach Hydraulic Hoses and Cables

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

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

There are also 5 electrical cables for the pendant, heater, indexer, transducer, and indexer switch box.

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



PH01299-3-4-98

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

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

There are also 3 electrical cables for the pendant, heater, and position transducer.

Connect the extension cables for the pendant, heater, and position transducer. The extension cables are connected between the electrical connection on the machine and the electrical connection on the component.

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

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



PH04787-10-8-12

TX05325-08-01-17

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.

TX04250-04-18-16



SAFETst.12.14-92

WR0001.4-3-8-93

Required Equipment

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

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



PH04800-10-23-12

TX04532-10-24-12

Lifting

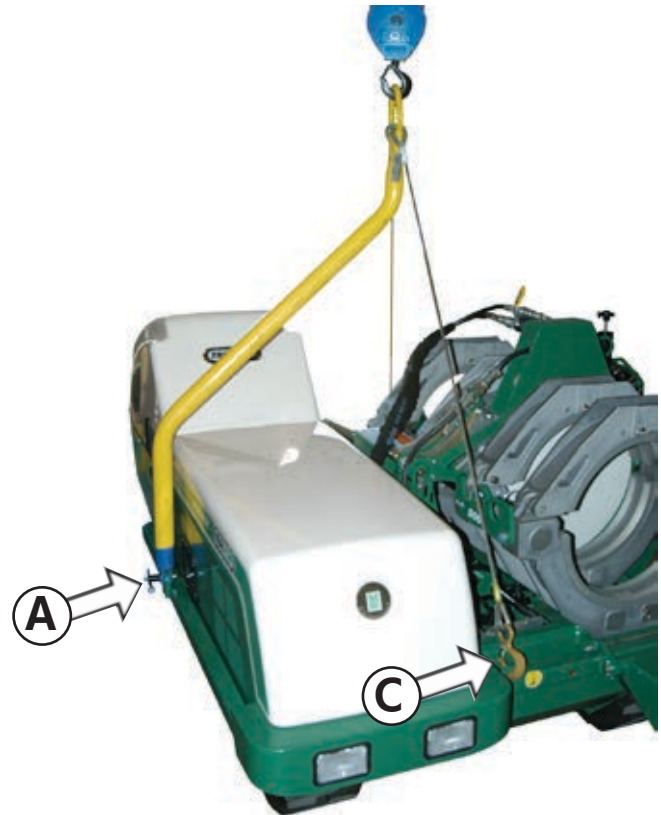
Attach Slings

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

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



PH04791:10-24-12



PH04792:10-24-12

Maintenance

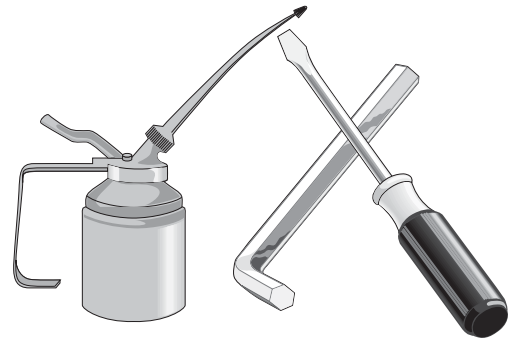
Preventative Maintenance

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

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

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

TX00428-8-10-95



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.

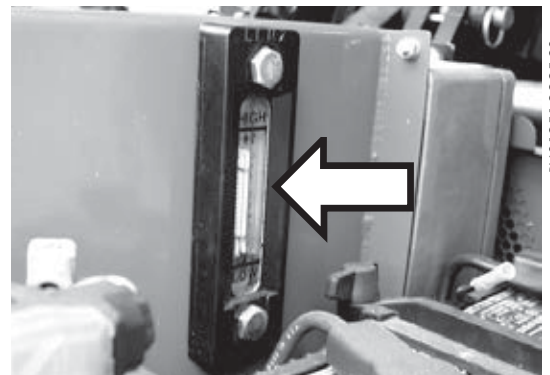
If hydraulic oil is not visible in the sight gauge, oil must be added.

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

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

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

TX01913-1-15-01



PH01251-2-25-98

Change Hydraulic Fluid and Filter

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

Fluid should also be changed as extreme weather conditions dictate.

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

TX05323-08-01-17



PH02000-10-24-12

Maintenance

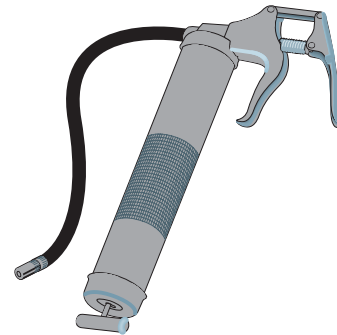
Grease

Keep moving parts well lubricated daily with high temperature grease.

Indexer carriage bearings

Facer pivot bushings

Heater pivot bushings



CD00183-10-22-12

TX04522-10-24-12

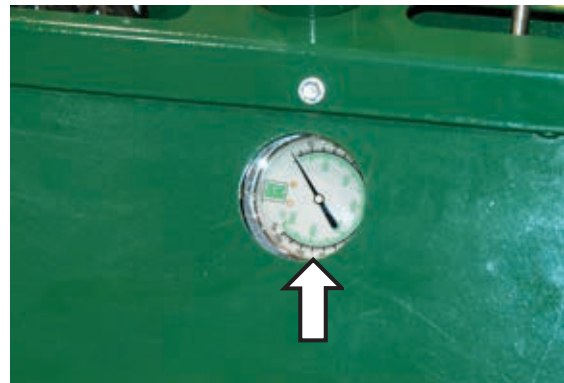
Adjusting System Pressure

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

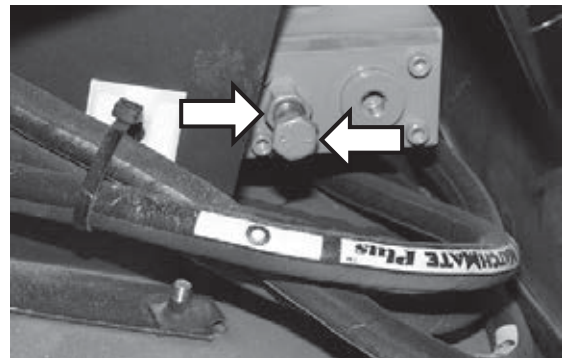
Start the engine and select high speed.

The system pressure should be at 2300 psi.

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



PH04801-10-22-12



PH01312-3-12-98

TX04523-10-24-12

Bleeding Air From Fuel Line

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

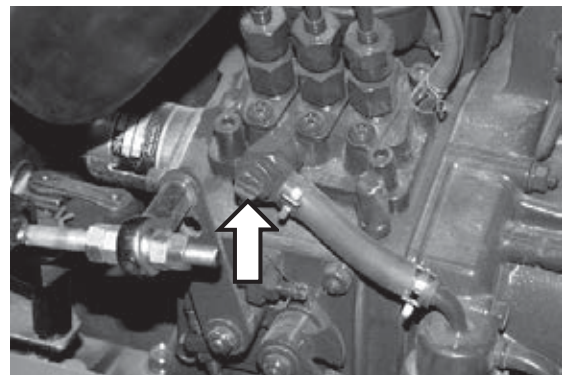
Loosen the air vent plug where the fuel line from the pump goes to the injectors.

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

Tighten air vent plug.

The engine can now be started.

TX01505-3-12-98



PH01309-3-12-98

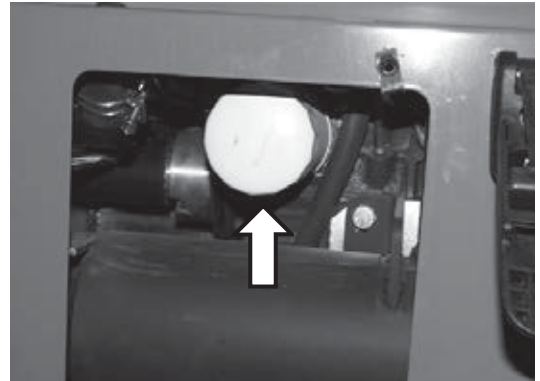
Maintenance

Engine Oil System

Read the engine maintenance instructions for scheduled maintenance intervals.

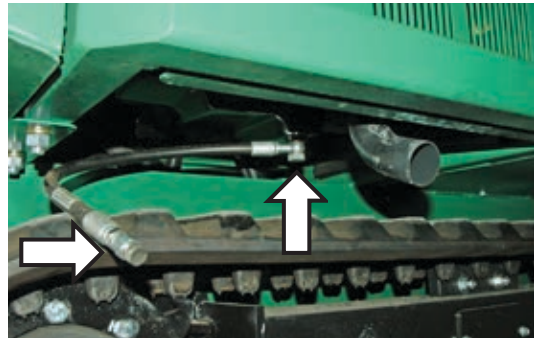
Use appropriate oil for the ambient temperature.

The oil filter is located behind the engine access panel.



PHO1311-3-12-98

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



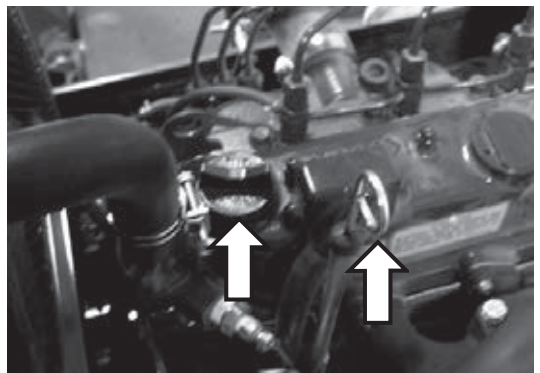
PHO4768-10-8-12

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



PHO4802-10-8-12

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



PHO1313-3-12-98

Maintenance

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.



PH04741-10-8-12

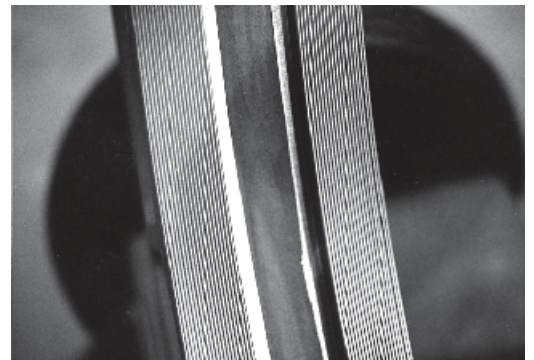
TX04939-04-18-16

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.



PH00927-8-20-96

TX00433-04-18-16

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.

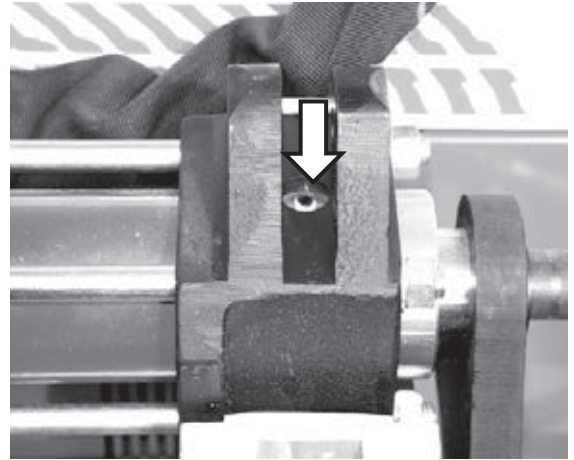
Escaping fluid under pressure can penetrate the skin causing serious injury. Keep hands and body away from pinholes which eject fluid under pressure. Use a piece of cardboard or paper to search for leaks. If any fluid is injected into the skin, it must be immediately removed by a doctor familiar with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



PH01296-3-4-98

TX05180-04-10-17

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.



PH0469-10-8-12

TX02716-04-18-16

Maintenance

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

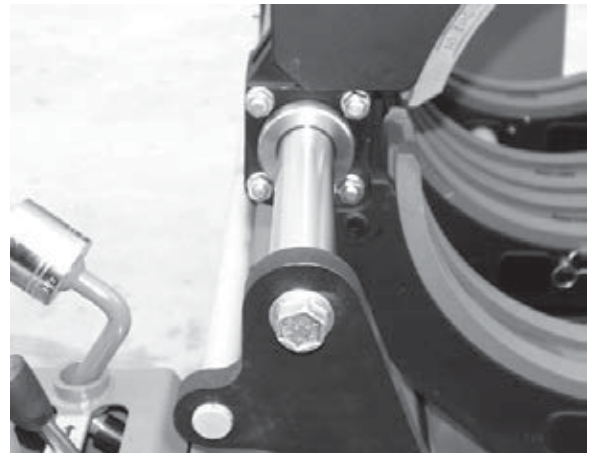


PH04738-10-24-12

Fasteners Must Be Tight

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

TX00437-9-13-94

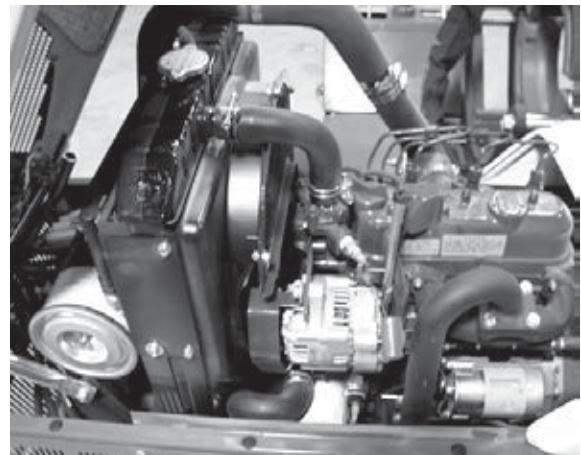


PH01282-2-25-98

Engine Maintenance

Refer to the operation and maintenance manual for the engine.

TX01500-3-5-98



PH01293-3-3-98

Maintenance

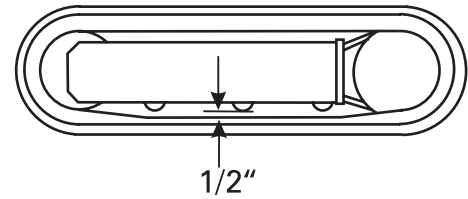
Checking Track Tension

Park the machine on a flat solid surface.

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

Place adequate supports under the bottom frame after lifting.

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



CD004632-25-98

TX01472-22-98

Adjusting Track Tension

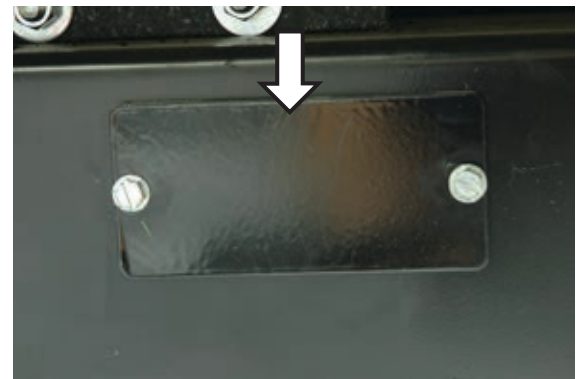
⚠ WARNING The grease in the hydraulics of the track is pressurized. If the grease valve is loosened too much, grease can be expelled at high pressure and cause serious injury. Never loosen grease valve more than one turn. Injury could also result if the grease nipple is loosened. Never loosen the grease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

Remove screws and cover to access the adjustment system.

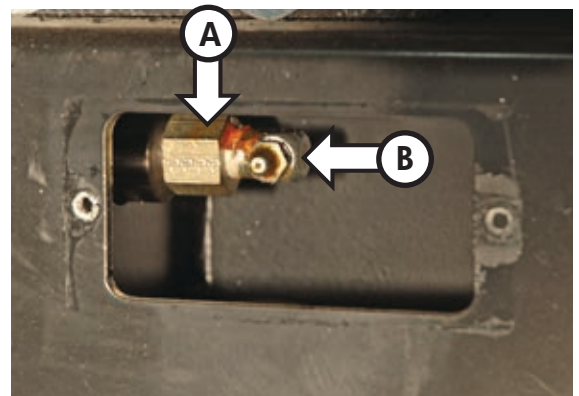
To loosen the track, turn hex shaped valve **(A)** counterclockwise no more than 1 turn. If grease does not start to drain out, then slowly rotate the track. When correct track tension is obtained, turn valve clockwise and tighten it. Clean off any expelled grease.

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 and tighten down with screws.



PH03300-9-18-06



PH03301-9-18-06

TX02632-08-02-17

Maintenance

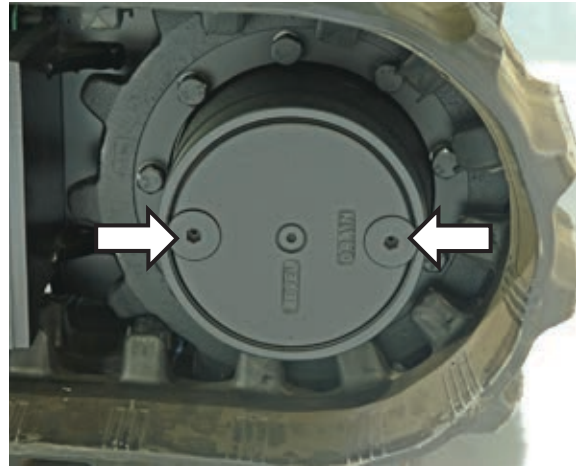
Checking Track Gearbox Oil

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

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

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

Replace the plugs and tighten



PH03299-9-18-06

TX01474-11-30-10

Changing Track Gearbox Oil

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

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

Remove both plugs and drain out all oil.

Move machine until the plug holes align horizontally.

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

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

Replace the plugs and tighten.



PH03298-9-18-06

TX02633-6-20-06

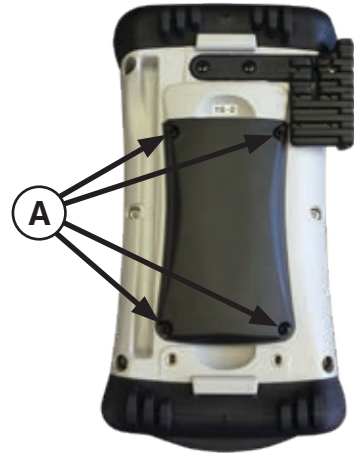
Maintenance

Install SIM Card

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

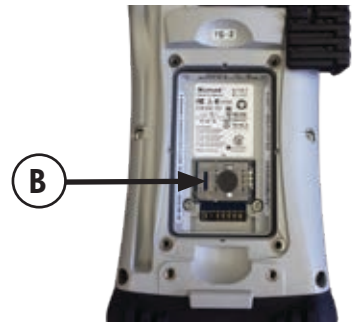
A SIM card can be purchased through a cellular carrier. The Trimble® Nomad handheld computer uses GPRS, Edge, or 2.5G SIM cards.

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



PH05585-06-30-16

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



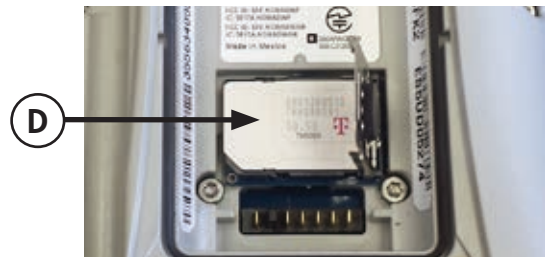
PH05586-06-30-16

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



PH05586-06-30-16

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

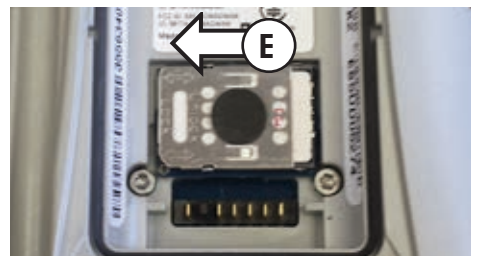


PH05587-06-30-16

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.




PH05588-06-30-16

Maintenance

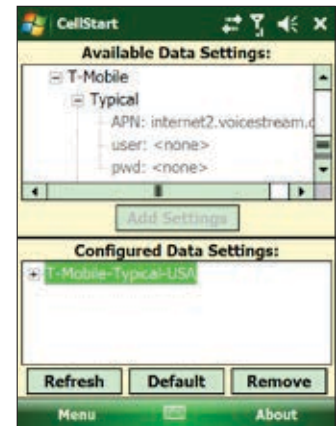
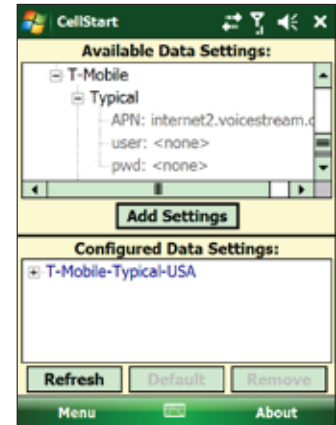
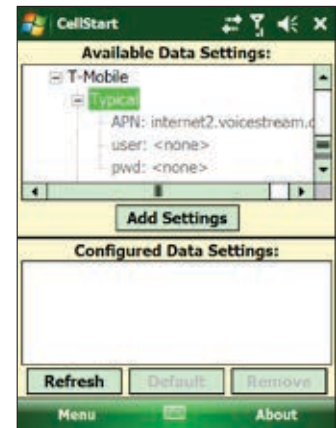
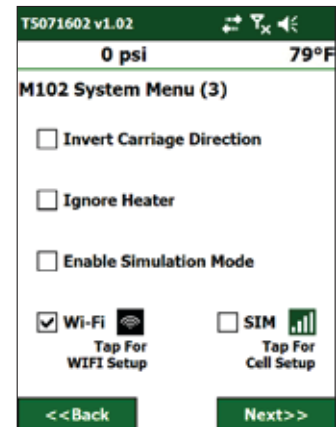
Install SIM Card (continued)

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.



Maintenance Checklist

TracStar® 500 Series 3 Auto

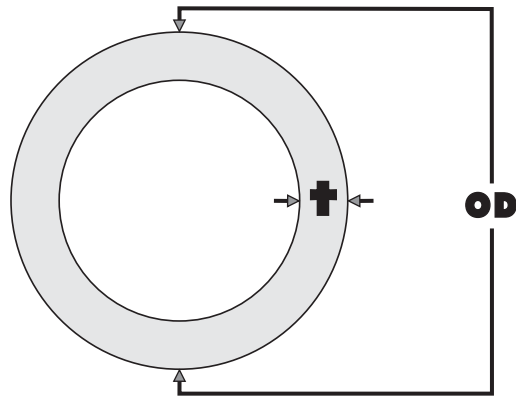
TRACSTAR INSPECTION CHECKLIST		OK
1.	For engine maintenance & service, Review engine manual	
2.	Machine is clean	
3.	Inserts and inserts keeper pins are with machine	
4.	All nuts & bolts are tight	
5.	All identification placards are on unit	
6.	Hi/Lo adjustment threads are lubricated	
7.	Wiring, battery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

TX04527-10-24-12

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)



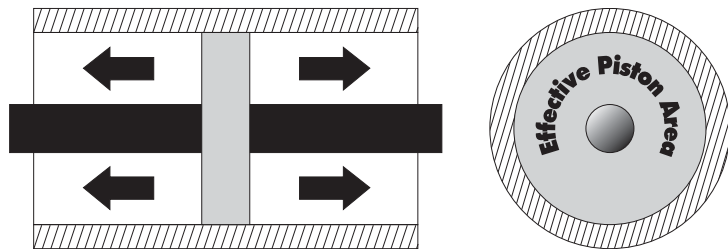
Formulas

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

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

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

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



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.

TX0308204-18-16

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

Fusion Machine Dimensions

Length, Pipe Lift up: 94.5" (2,400mm)
Track Width: 50.5" (1,283mm)
Overall Width: 67.5" (1,715mm)
Centerline Height, Carriage: 32.5" (826mm)
Overall Height: 53" (1,346 mm)

Fusion Machine Weights

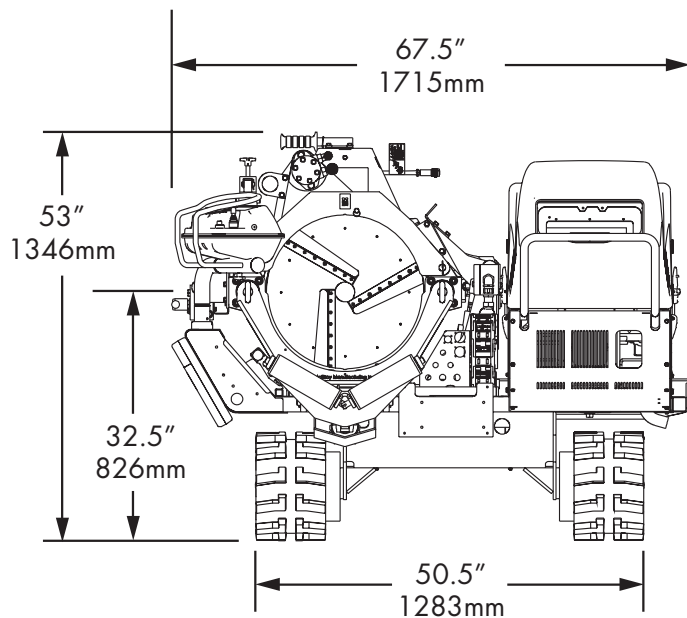
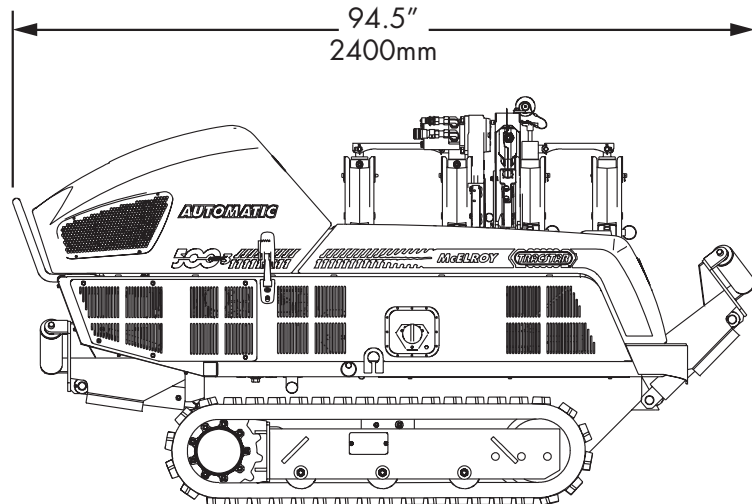
Total Vehicle Weight (fluids full): 3183 lbs (1,444kg)
Carriage, 4 Jaws: 740 lbs (336kg)
Carriage, 3 Jaws: 355 lbs (161kg)
Facer: 98 lbs (45kg)
Heater: 63 lbs (29kg)
Heater Stand: 17 lbs (8kg)
Facer Stand: 21 lbs (10kg)

Specifications

Maximum Pipe Diameter: 20" (500mm)
Minimum Pipe Diameter: 6" (180mm)
Effective Piston Area: 6.01 sq in (38.7 sq cm)
Maximum Force: 13,823 lbs (6,270kg)
Travel Speed: Low Speed 1.18 mph
High Speed 2.08 mph

Power Pack

23.5 hp (17.5kW) 1001 cc, 3-cylinder, Liquid Cooled Diesel Engine
11 gal (42 liters) Fuel Capacity
Operational Fuel Capacity (Auto Throttle): 11 hours
2,300 PSI (158 bar) Operating System pressure
12 gal (45 liters) Hydraulic Reservoir
6,500W Direct Drive Alternator



About this manual . . .

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

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

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

TX001660-8-19-99



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