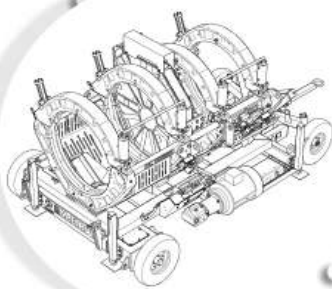


Operator's Manual



McELROY

www.mcelroy.com

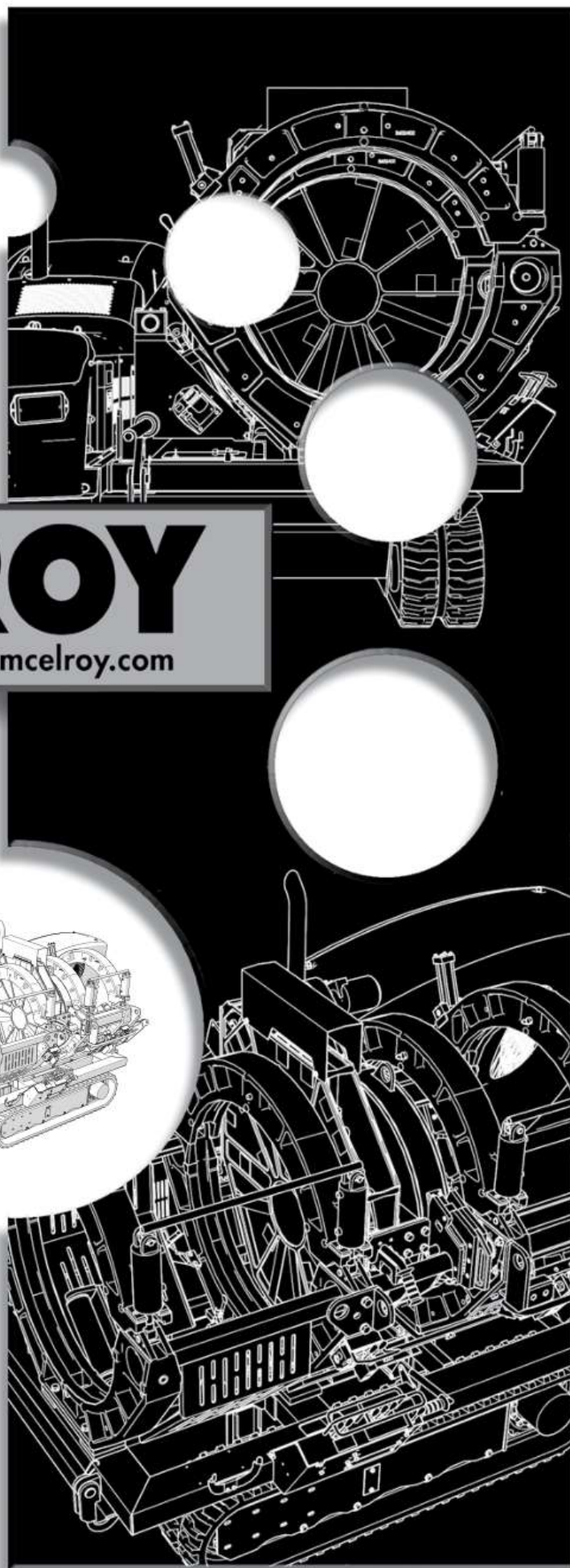
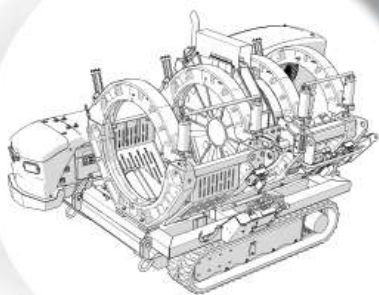


MegaMc®
824/1236

Series 2
and **TRACSTAR**

630/900

Series 2
Fusion Machines



WARNING

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

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

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

8163362

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

Introduction

Thank You for choosing McElroy

The TracStar® 630 Series 2 and MegaMc® 824 Series 2 machines will butt fuse pipe sizes from 8" IPS (225mm) to 24" OD (630mm).

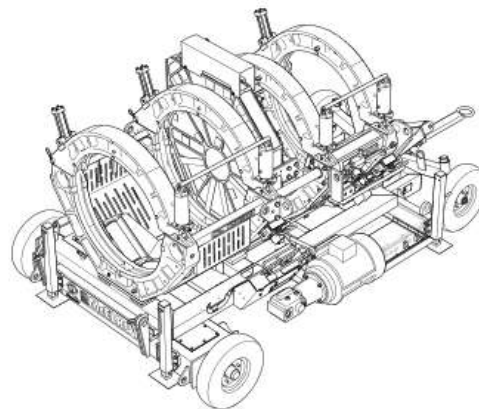
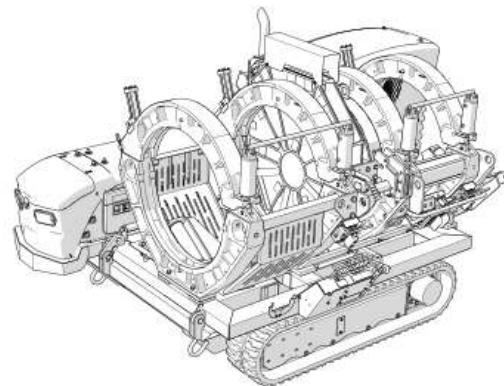
The TracStar® 900 Series 2 and MegaMc® 1236 Series 2 machines will butt fuse pipe sizes from 12" IPS (340mm) to 36" OD (900mm).

The carriage has 4-jaws with a removable 3-jaw carriage and is capable of top loading the heater and facer to maximize functionality with limited space. The TracStar carriage is mounted on a vehicle with independently controlled, self propelled tracks and features a radio remote driving control. Both models are hydraulically powered to assist all fusion functions including the operation of the jaws, pipe lifts, heater and facer. The machines allow for butt fusion of most fittings without special holders or removal of outer jaw. Optional mitered inserts are available for fabricating ells.

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.

TX05304-07-06-17



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



MU2-03-13-14



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 _____



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Tulsa, Oklahoma, USA

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Safety

Safety Alerts

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

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



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



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



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

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

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

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

TX00030-12-1-92



WR00051-11-30-92

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.



SAFET1ST-12-22-92

TX00114-4-22-93

Wear Safety Equipment

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

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



WR00053-12-2-92

TX00032-04-18-16

Fuel Handling



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



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



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



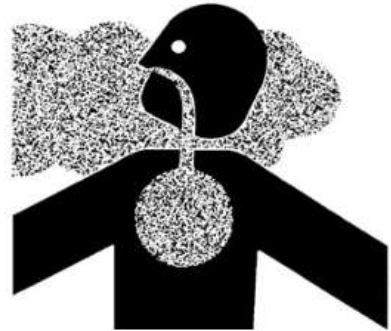
WR00080-4-12-93

Carbon Monoxide



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



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

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

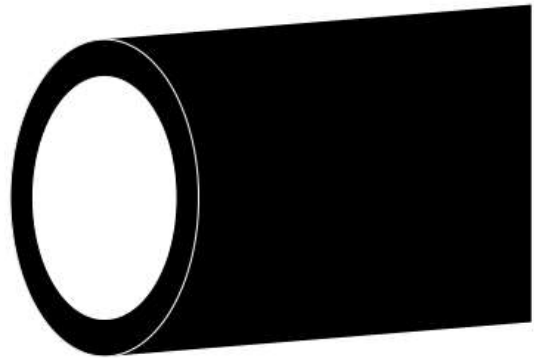
Pipe that is bent can store a great amount of energy. Do not bend and force the pipe into the machine. A bent pipe with stored energy can generate tremendous force when that energy is released.

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

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 hydraulics are activated. Always ensure machine power is off before entering the machine for any reason.



WR00012-12-4-92

TX03004-07-08-19

Safety

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

Do Not Ride Machine

⚠ WARNING

Do not ride on the machine while it is moving. Riding on the machine could cause the person to fall from or into the machine. Do not drive or tow the machine while persons are on the machine.



WFR00115-01-25-16

TX04883-04-18-16

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

⚠ WARNING

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



WR00055-4-7-93



WR00025-11-30-92

TX03003-10-12-10

Units With Hydraulics

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

⚠ WARNING

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

⚠ WARNING

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

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



WR00078-4-8-93

TX03007-04-18-16

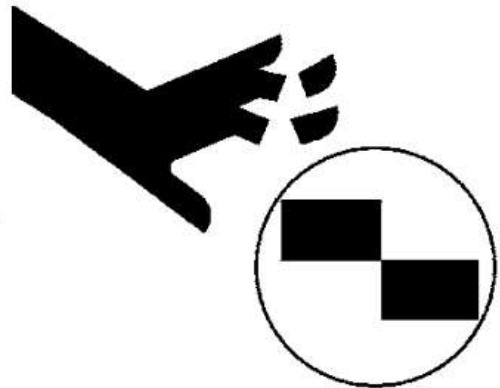
Safety

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

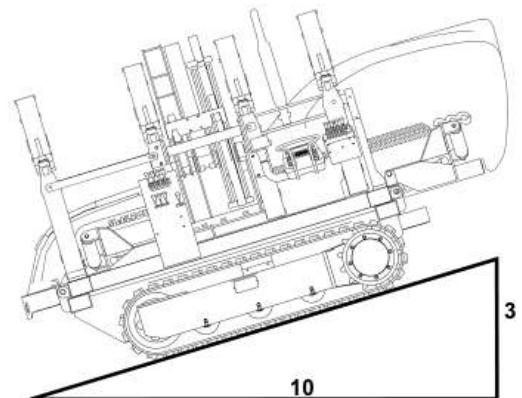
Positioning and Setting Fusion Machine

Place fusion machine on as level ground as possible.

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

TracStar:

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



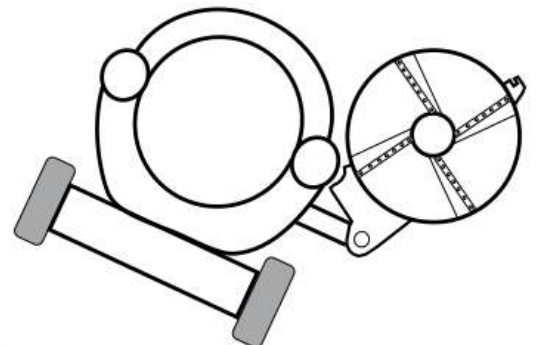
CD00547-8-19-99

MegaMc:

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

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

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



WR00089C-4-7-93



WR00076_1-8-25-09

TX04980-04-18-16

Safety

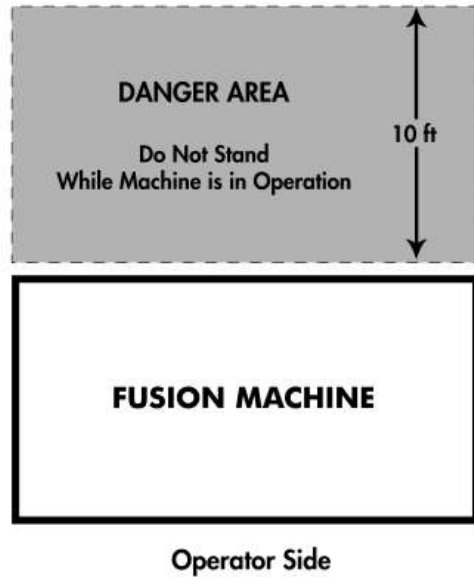
Stand Clear

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

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



TX00822-05-26-15

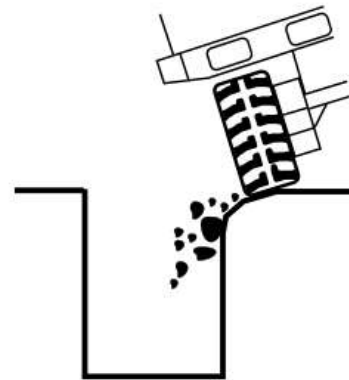


CD01596-03-14-16

WR00091-3-4-96

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.



TX01447-04-18-16

CD00408-12-31-97

Have Tires Properly Serviced (MegaMc)

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



TX00118-4-22-93

WR00083-4-22-93

Safety

Heater Is Hot



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



WR00030-2-10-93

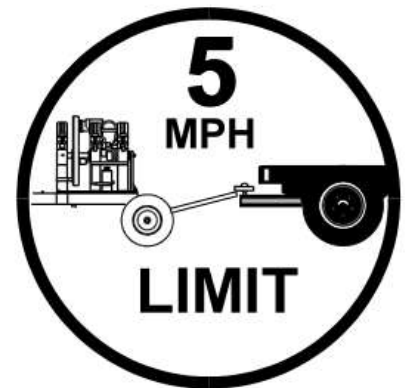
Towing MegaMc

The machine towing speed limit is 5 mph.

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

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

TX05312-07-11-17

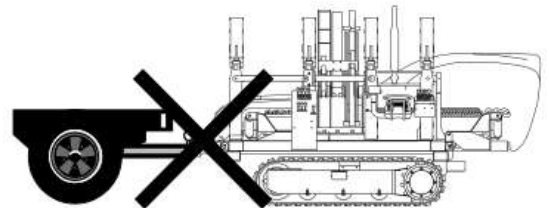


CD00189-1-24-96

Do Not Tow TracStar

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

TX04245-04-18-16



CD00548-8-19-99

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



WR00079-2-7-96

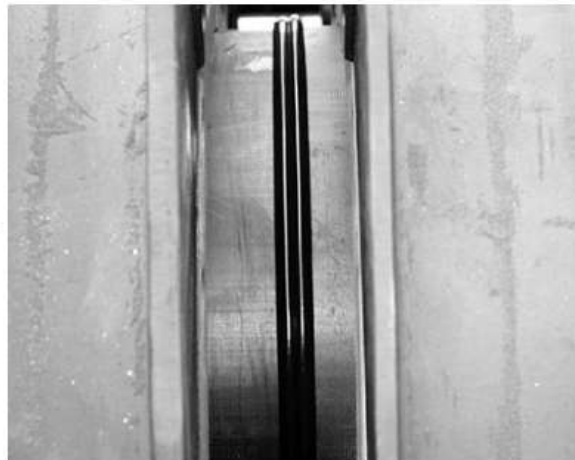
Overview

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.



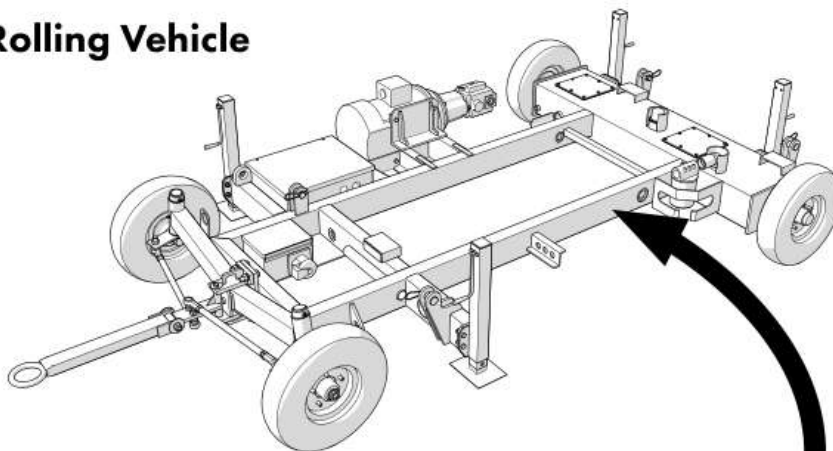
PH01269-2-1-98

Overview

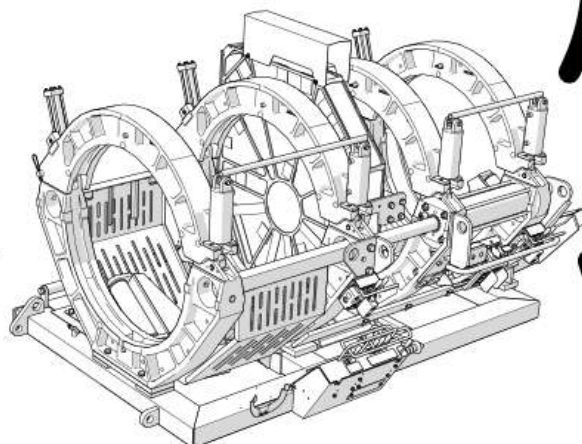
Carriage Assembly and Vehicles

The carriage assembly comes configured on the TracStar tracked vehicle or MegaMc Rolling vehicle and is removable for off vehicle fusions. The carriage assembly is interchangeable with both vehicles.

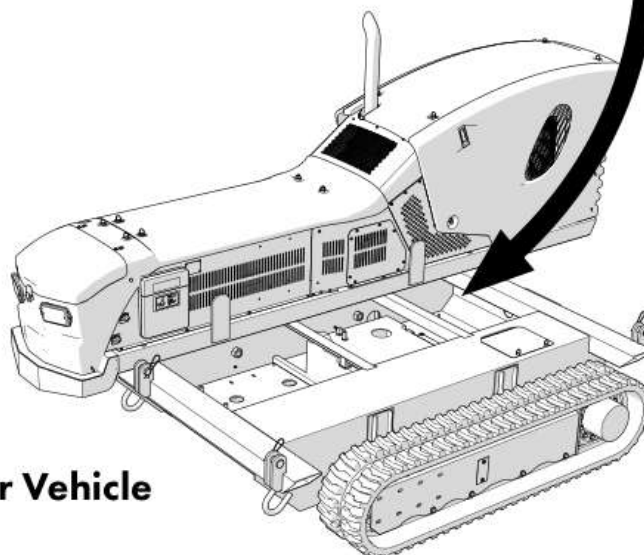
Rolling Vehicle



Carriage Assembly

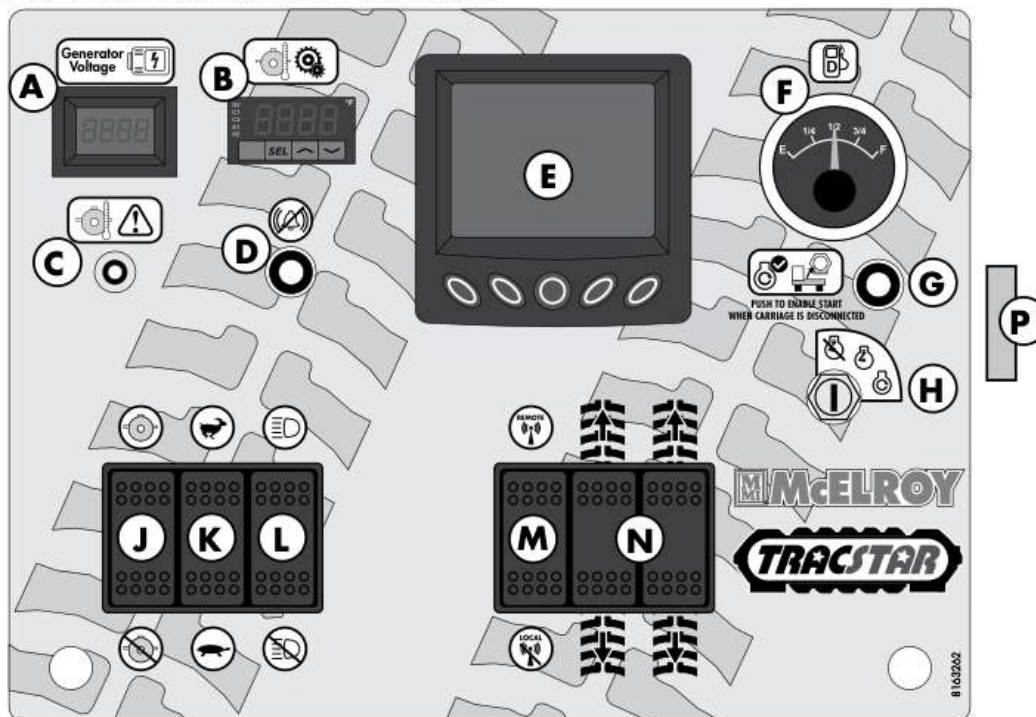


TracStar Vehicle



Overview

TracStar® 630 and 900 Series 2 Console



For detailed explanations of items below, refer to the Operations section of this manual.

- A - Generator Voltage** - Displays the voltage output from the generator.
- B - Heater Temperature Settings** - Set heater temperature, change temperature offset, etc.
- C - Heater Element Failure Lamp** - signals a heater error condition by flashing various error codes. Refer to Maintenance section.
- D - Alarm Disable** - disables fault alarms from machine faults.
- E - Engine Control Monitor** - Displays engine information and allows setting maintenance reminders.
- F - Fuel Gauge** - Displays the fuel level of the machine.
- G - Carriage Disconnected Machine Start** - Press the push button to start the machine with the carriage disconnected.
- H - Key Switch** - Switch to start and stop the machine.
- J - Heater On/Off** - Turns the heater on and off.
- K - Engine Speed** - Change engine speed between Low and High.
- L - Drive Lights** - Turns the vehicle lights on and off.
- M - Remote Switch** - Enable/Disable the vehicle radio remote.
- N - Drive Tracks** - Controls movement of the vehicle's tracks.
- P - Cummins® Diagnostic Port** - Connect a Cummins® engine diagnostic device to the machine with this port.

Overview

Radio Remote (TracStar)

Remote control of engine and track functions.

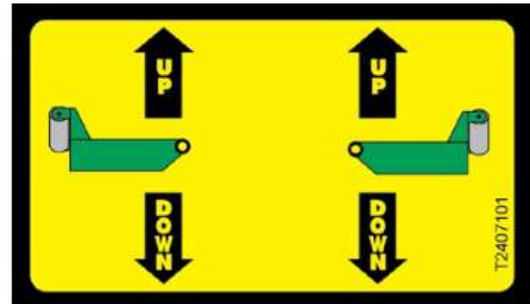


- | | | |
|-----------------------------|--|--|
| 1) Engine Speed | Change engine speed between low and high. | |
| 2) Headlights | Turn headlights on and off. | |
| 3) Track Speed | Change track speed between low and high. | |
| 4) Radio Disable | Press in to disable the radio and pull out to enable. | |
| 5) Drive Left Track | Drive the left track forward or backward. | |
| 6) Crawl Switch | Toggles crawl driving mode on and off. | |
| 7) Power Light | Indicates the remote is on. | |
| 8) Radio Standby | Set switch to standby to disable drive controls and to run to enable drive controls. | |
| 9) Drive Right Track | Drive the right track forward or backward. | |
| 10) Remote Pairing | Pairs the transmitter to the receiver on the fusion machine. | |
| 11) Engine Preheat | This button is not used with this machine. | |
| 12) Power Switch | Powers the radio remote on and off and selects programming mode with red key. | |
| 13) Engine Stop | Stops the engine. | |
| 14) Engine Start | Starts the engine. | |

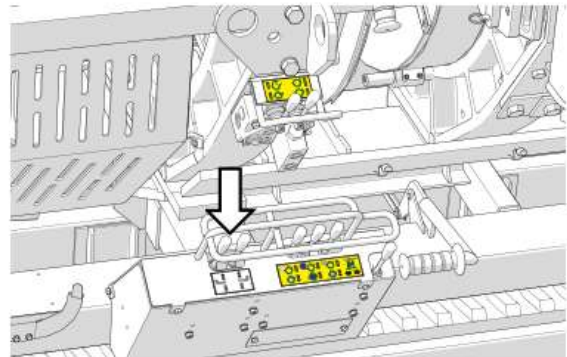
Overview

Pipe Lift Controls

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



PH05508-05-18-16

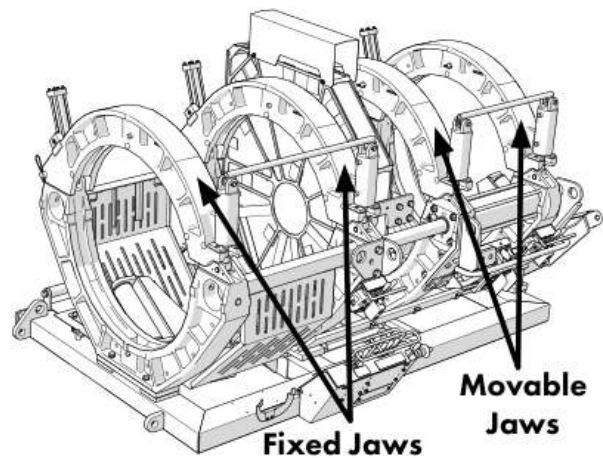


TX01663-8-19-99

Carriage Assembly

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

The carriage assembly can be removed from the machine in a 3-Jaw or 4-Jaw configuration.



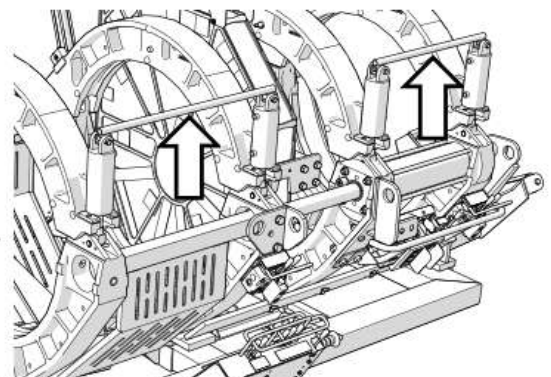
TX04893-04-18-16

Jaw Clamps

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

There are handles connecting both clamping cylinder sets, fixed and movable jaws, that are used for pivoting the clamps away from and towards the upper jaws.

CAUTION The clamp cylinders are heavy and can fall causing injury. Hold the handle between both cylinders when clamping or unclamping the cylinders. Failure to do so could result in injury.

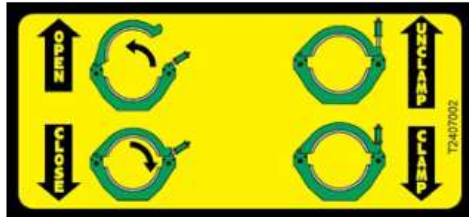


TX04890-04-18-16

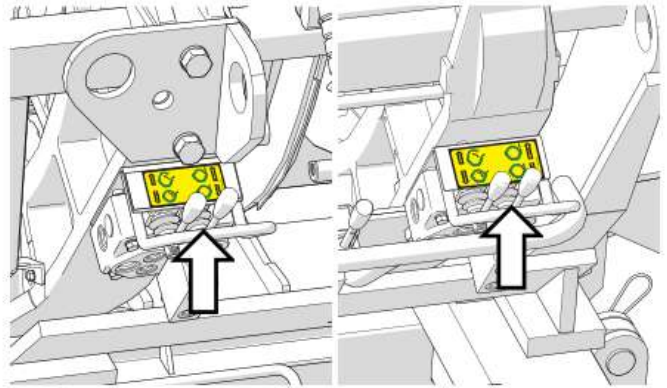
Overview

Jaw Pivot and Clamp Control

Graphics on controls label indicate direction of valve lever movement for operation required.



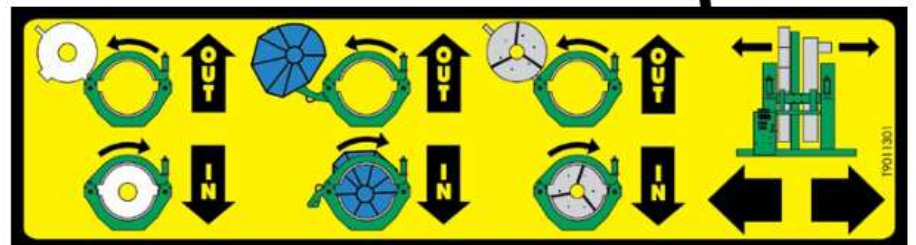
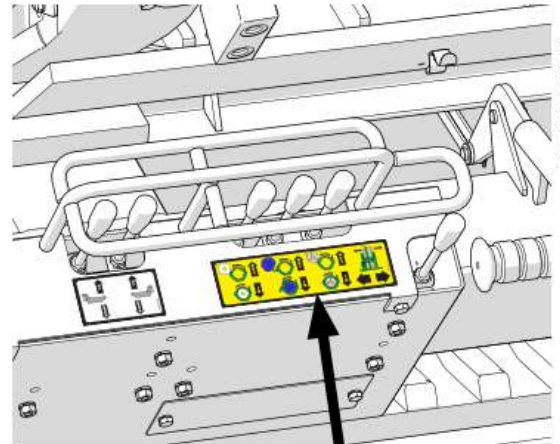
TX04888-04-18-16



PH03509-05-18-16 CD01756-07-21-16 CD01758-07-21-16

Indexer, Heater and Facer Controls

Graphics on controls indicate the operation of the control.



PH03511-08-01-16

TX05048-06-28-16

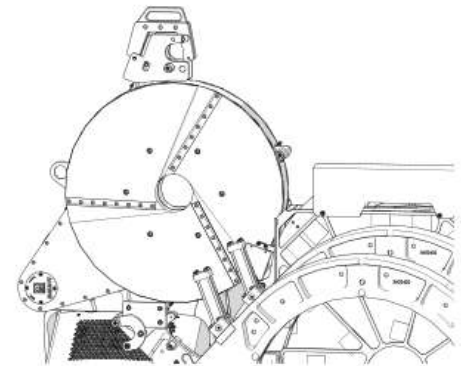
Overview

Facer

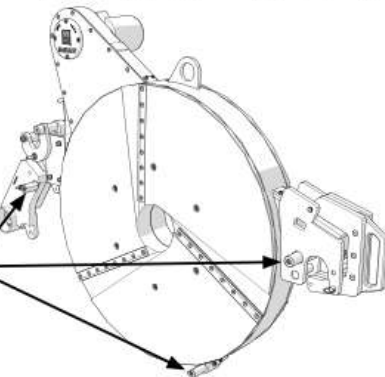
The facer is a rotating planer-block design. The blade holders each contain three blades and are chain driven (enclosed in lubricant) by a hydraulic motor. There are facer stops that allow for a specific amount of faced pipe to protrude from the jaws.

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

The optional extension kit as well as the optional in-ditch heater/facer stand are needed for modular facer operation.



CD01643-05-19-16



CD01644-05-19-16

**Facer Stops
(Both Sides)**

TX05049-06-28-16

Heater

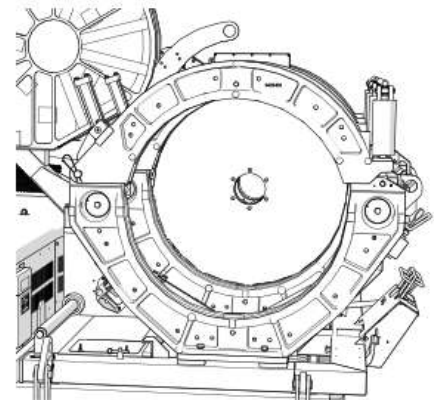
The heater is equipped with butt fusion heater plates coated with an anti-stick coating.



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

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

The optional extension kit as well as the optional in-ditch heater/facer stand are needed for modular heater operation.

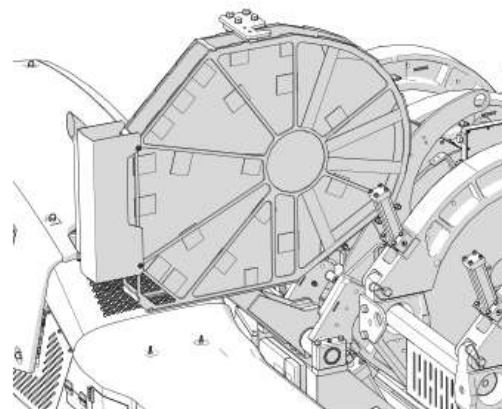


CD01760-08-01-16

TX05050-06-28-16

Heater Shield Frame

The heater shield frame protects and insulates the heater when the heater is not in use. For fusing operation, the frame must be pivoted to the out position before operating the heater pivot.



CD01646-05-19-16

TX05051-06-28-16

Overview

Power for Heater

IMPORTANT: For TracStar machines, the engine must be in high speed to power the heater.

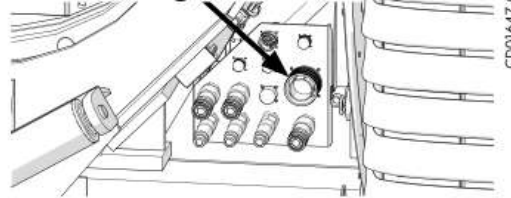
WARNING Ensure heater power is off before connecting or disconnecting heater power cables. Failure to do so may result in electrical shock.

There is a large heater power cable and a small RTD cable with receptacles that connect at the carriage bulkhead.

NOTICE: The large heater power cable is attached to the bulkhead different from the other connectors and the couple/uncouple direction of the connector is reversed. Clockwise to uncouple and counter-clockwise to couple the power cable.

TX05052-01-21-20

Heater Receptacle on Carriage Bulkhead



CD01647-06-30-16

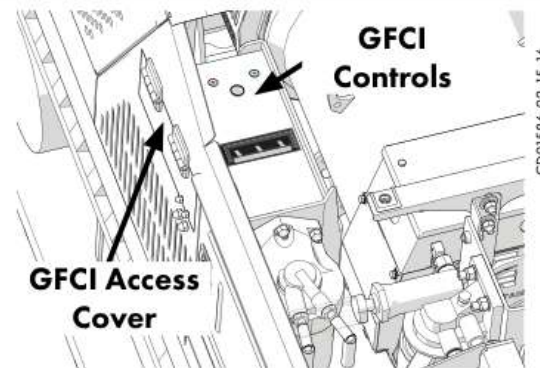
Ground Fault Circuit Interrupter (GFCI) (TracStar)

The GFCI monitors electrical current for an unintended grounding instance and disables the electrical power in that situation to prevent electric shock to operating personnel.

NOTICE: GFCI may trip the circuit breaker on engine startup due to initial voltage fluctuations produced by the generator. If this occurs, the circuit breaker must be reset before the heater can receive power.

Test the GFCI module regularly in accordance with local rules and regulations. Refer to the Maintenance section for GFCI testing procedure.

TX04897-06-12-19



CD01586-02-15-16

Electrical Power (MegaMc)

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

See Specifications section of this manual for power requirements.

Ensure proper ground for the electrical system.

TX04984-04-18-16

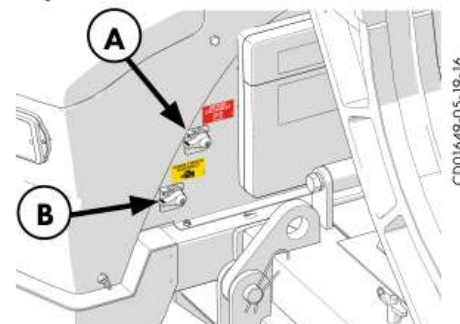


PH00741-3-12-96

Battery and Engine Starter Disconnect Switches (TracStar)

The battery disconnect switch (A) removes the battery power to the system.

The engine starter disconnect switch (B) disables the engine starter.



CD01649-05-19-16

TX04891-04-18-16

Overview

Electrical Box (MegaMc)

Control Panel

1. **Temperature Adjustment.** Digital controller used to set heater temperature.
2. **Heater On/Off.** Turns electrical power on and off to heater.
3. **Volt Meter.** Displays incoming voltage from the power source.
4. **Volt Meter Selector Switch.** Allows for selecting each incoming phase of a 3-phase electrical system.
5. **Hour Meter.** Registers total hours hydraulic pump has been used.
6. **Stop - Hydraulic Pump.** Shuts off power to the hydraulic pump.
7. **Start - Hydraulic Pump.** Turns power on to the hydraulic pump.
8. **Start - Carriage Disconnect.** Press this button, then the Motor Start - Hydraulic Pump button to turn power on to the hydraulic pump when the carriage is disconnected.
9. **Reverse Phase Relay.** Interrupts power and prevents pump from turning the wrong direction.

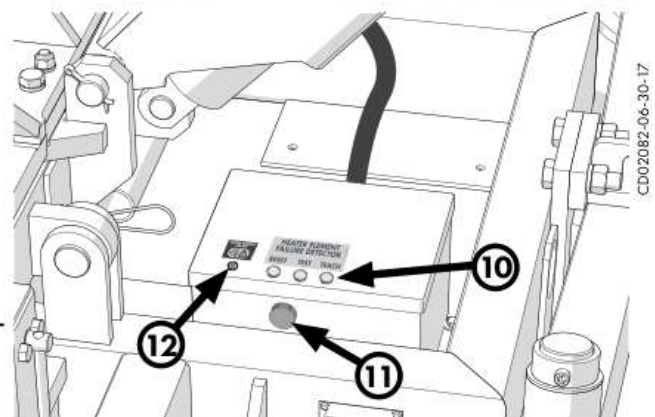
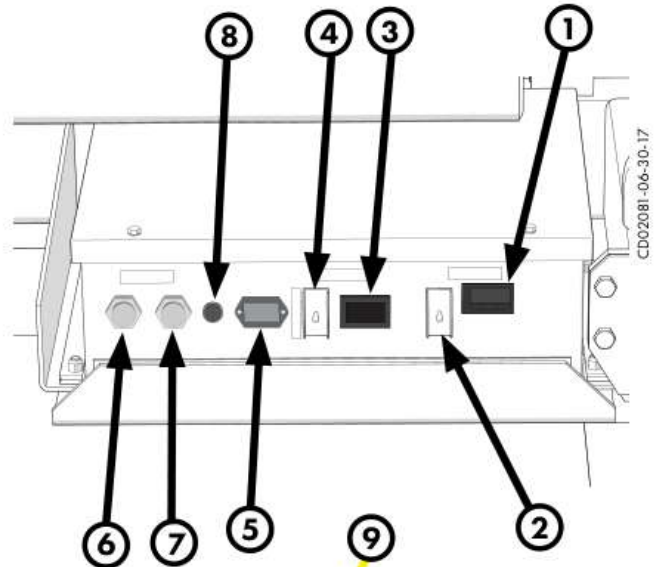
To open the control panel box, remove the front side mounting bolts and loosen the rear bolts. Grab the front bracket of the electrical box and pull the box out. Loosen the screws on the top of the box to open it.

Heater Box Panel

10. **Heater Element Failure Detector.** Displays error coding and has buttons to Reset, Test, and Teach the detector. For operation instruction, see the Maintenance section of this manual.
11. **Alarm.** Makes audible tone to indicate heater element failure.
12. **Heater Element Failure Lamp.** Will illuminate if there is a heater element failure. Signals a heater error condition by flashing various error codes. See Maintenance section.



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



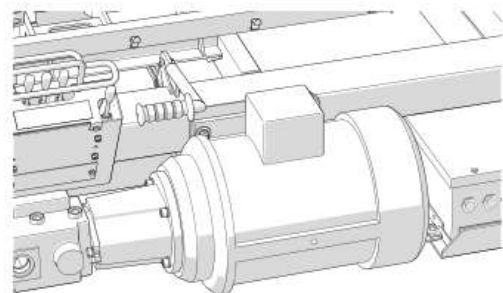
Overview

Electric Motor (MegaMc)

The electric motor powers the machine's hydraulic pump. It is a totally enclosed fan cooled motor.

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

TX00720-04-18-16



CD02077-06-29-17

Diesel Engine (TracStar)

Read and understand the engine owner's manual instructions before operating.

A machine with the Diesel Fuel Only label has an engine capable of using high sulfur diesel fuel.



A machine with the Ultra Low Sulfur Diesel Fuel Only label has an engine that uses only ultra low sulfur diesel fuel.

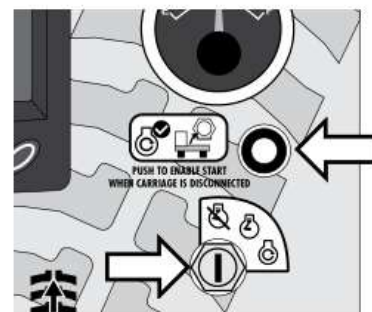


DANGER Combustion engines can cause explosions when operated in an explosive atmosphere. Do not operate gas or diesel powered machines in an explosive atmosphere.

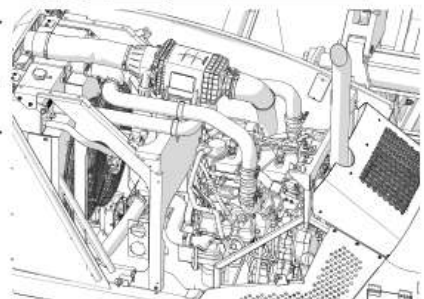
When operating in an explosive atmosphere, keep vehicle in a safe area by using hydraulic extension hoses to the carriage.

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

TX04892-04-20-17



CD01465-01-07-16



CD01652-05-20-16

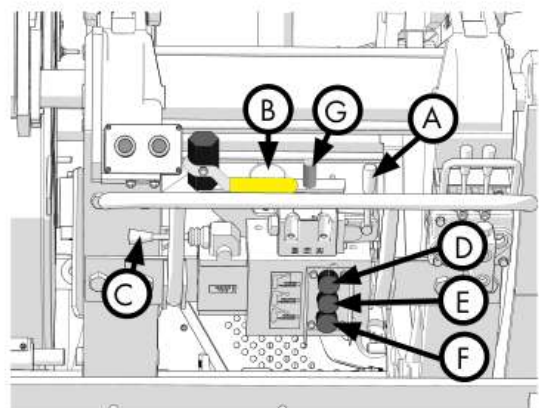
Carriage Manifold Block

Parts of the carriage manifold block:

- A) The carriage directional valve, mounted on the top of the manifold, determines whether the carriage is moving left, right, or is in neutral.
- B) A 3000 psi carriage pressure gauge is mounted on a bracket above the manifold.
- C) The selector valve, mounted on the upper left of the manifold, selects a reduced pressure from one of the three pressure reducing valves.

Each pressure reducing valve is labeled with a different function:

- D) The top valve adjusts facing pressure to a maximum of 800 psi.
- E) The middle valve adjusts heating pressure to a maximum of 800 psi.
- F) The bottom valve adjusts fusing pressure to a maximum of 2300 psi.
- G) DataLogger® port.



CD01761-07-25-16

TX05137-08-01-16

Overview

Hydraulic Fluid Reservoir

The fluid reservoir is located under the cowling behind the operator console of the TracStar vehicle and on the rear of the MegaMc vehicle. The fluid level sight gauge is located on the reservoir. It includes a thermometer which indicates fluid reservoir temperature.

Tracked Vehicle:

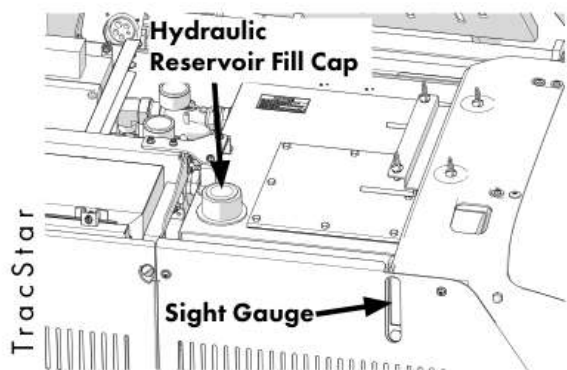
Fill to the bottom of the sight gauge when the fluid is cool to allow for fluid volume expansion.

Rolling Vehicle:

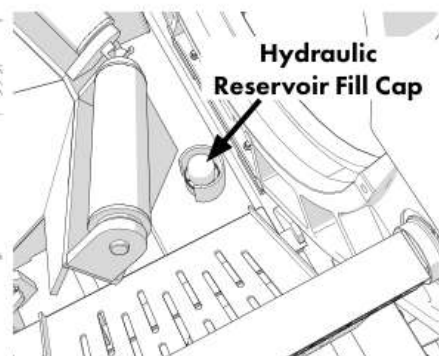
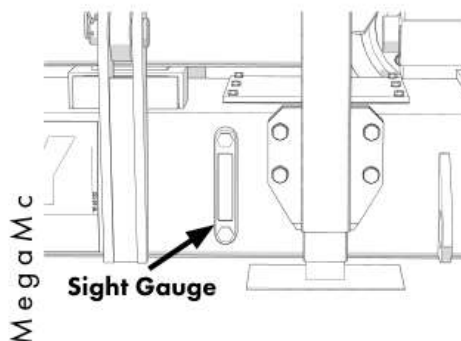
Fill to the top of the sight gauge when the fluid is cool.

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

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



CD01650-06-30-16



CD02078-06-29-17

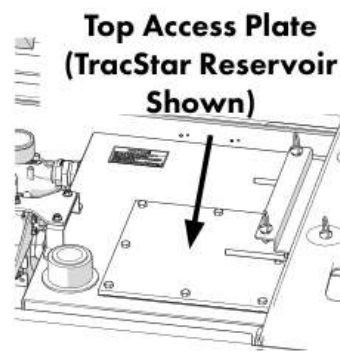
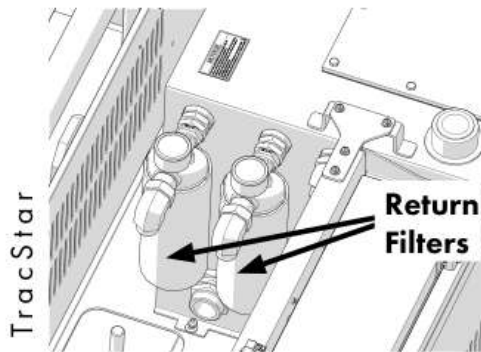
CD02079-06-29-17

Hydraulic Fluid Filters

The machine is equipped with two filters on the return side of the circuit and two magnetic suction filters.

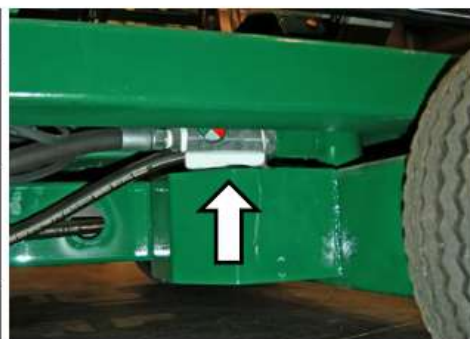
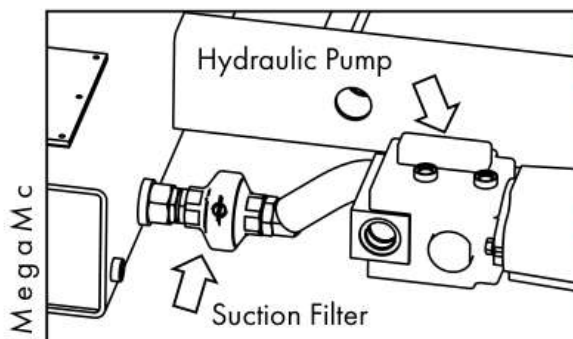
TracStar: The suction filter is located inside the fluid reservoir and are accessed by removing the top access plate.

MegaMc: The suction filter is located outside the fluid reservoir between the reservoir and the pump.



CD01762-07-25-16

CD01650-06-30-16



CD00771-1-21-09

PH03509-10-17-07

TX05307-07-06-17

Overview

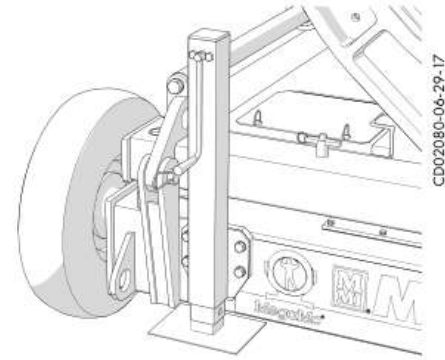
Outriggers (MegaMc)

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

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

The outriggers can also be used to make the machine immobile when the machine is not being transported.

NOTICE: All outriggers must be raised before moving the machine.



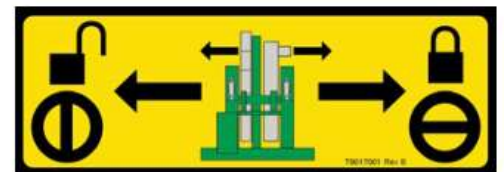
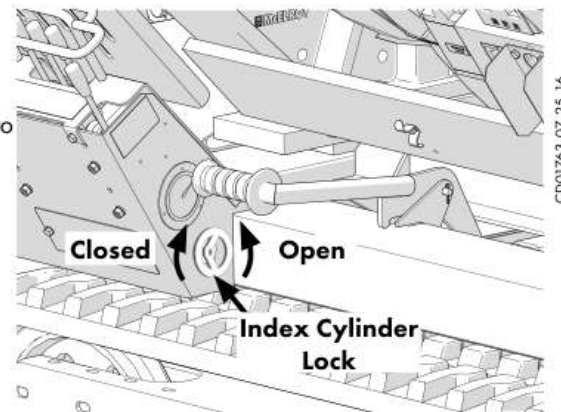
TX04902-04-26-16

Index Cylinder Lock

The index cylinder lock should be in the closed position for transporting.

Open the index cylinder lock before operating.

NOTICE: Open valve before operating, failure to do so will result in damage to the machine.



TX04253-06-28-16

CD02080-06-29-17

CD01763-07-25-16

PH05512-05-23-16

Operation

Read Before Operating

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

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



Stop-12-28-95

TX00401-03-16-16

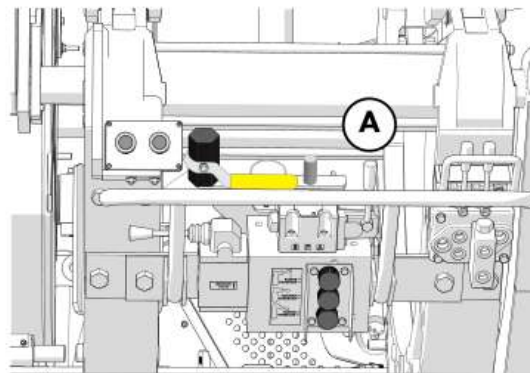
Before Starting

⚠ WARNING

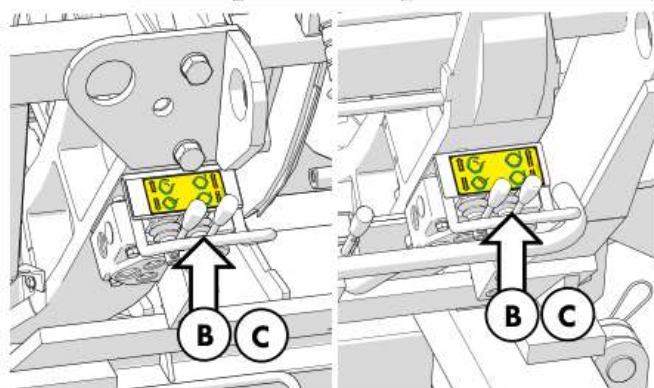
Unwanted movement of the machine could result in serious injury or damage to machine. Unwanted movement of the machine may take place if valves do not match machine state when the machine power is turned on.

Before starting this machine, ensure all valves/switches are in the following positions in order to prevent unwanted movement upon engine/motor startup:

- A** Carriage directional control is centered.
- B** Both clamp valves are centered.
- C** Jaw pivot valves match the current position of the jaws (open or closed).
- D** Both pipe lift valves are centered.
- F** Heater and facer pivot valves and indexer left/right valve are all in the center position.

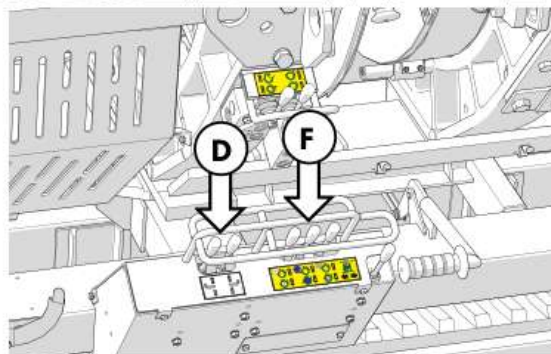


CD01761-07-25-16



CD01756-07-21-16

CD01758-07-21-16



CD01756-07-25-16

TX05138-08-01-16

Operation

Starting Instructions (TracStar)

Read and understand the engine owner's manual before operating.

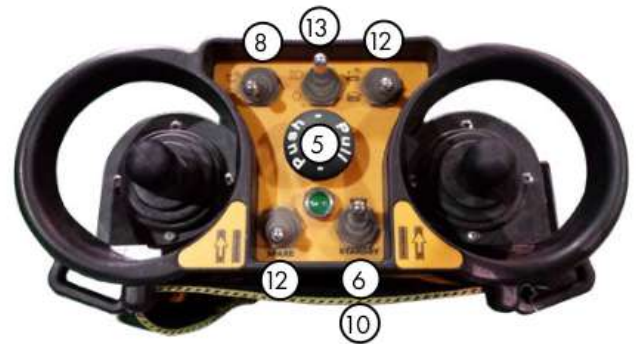
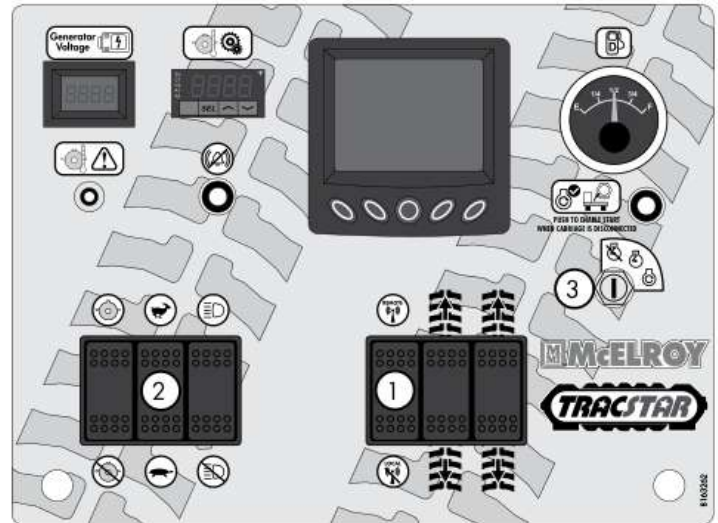
The ignition key has three positions. off, run and start.

Starting in Local Mode

- ① Set remote switch to Local. 
- ② Set engine speed to low. 
- ③ Turn key switch to start. If the carriage is disconnected, press the button near the key switch before starting the machine. 

Starting in Remote Mode

- ① Set remote switch to Remote. 
- ② Set engine speed to low. 
- ③ Turn the key switch to run. 
- ④ Turn power switch to on (I). 
- ⑤ Ensure remote disable is pulled out. 
- ⑥ The remote can be paired in Run or Standby. Pairing in Run requires the joysticks to be centered.
- ⑦ Press the Remote Pairing button to connect remote to receiver. 
- ⑧ Set engine speed to low. 
- ⑨ Push the engine start button until the engine starts. 
- ⑩ Ensure switch is in Run mode to drive the vehicle. 
- ⑪ To stop the engine, press the engine stop button until the engine is off. 
- ⑫ Actuate the track speed switch to change between high and low track speed or switch the track speed to crawl on for crawl mode. 
- ⑬ Actuate the headlights switch to turn the lights on and off. 
- ⑭ The remote has an engine preheat button which is not used on this machine. 



Operation

Driving Vehicle (TracStar)

⚠ WARNING

Before and while driving machine, ensure all jobsite personnel are visible to the machine operator at all times. If all personnel are not visible, stop machine movement and locate all personnel before proceeding.

IMPORTANT: The tracks will not move if the outriggers are not fully retracted. Ensure all outriggers are fully retracted before driving the vehicle.

Remote Switch (B) in Local Mode:

The tracks are operated by the toggle switches (A) on the main console.

Left drive toggle switch engages the track to the left of the operator.
Right drive toggle switch engages the track to the right of the operator.

To turn to the RIGHT, toggle the left switch away from the operator and the right switch toward the operator.

To turn to the LEFT, toggle the right switch away from the operator and the left switch toward the operator.

Remote Switch (B) in Remote Mode:

The tracks are operated with the radio remote.

⚠ CAUTION

When using remote mode, move the Radio Standby Switch (C) to "standby" when not driving the vehicle to prevent accidental machine movement.

With the Radio Standby switch (C) in "RUN" position and standing at the rear operator position, the radio remote drive left track and drive right track joystick movements correspond with the machine's left and right tracks as shown.



NOTICE: Be aware that standing at a location other than the rear operator position will affect the orientation of the radio remote drive track joystick movements relative to the machine's tracks.

The track speed switch is used to switch between:

high speed/low torque



low speed/high torque

crawl mode on

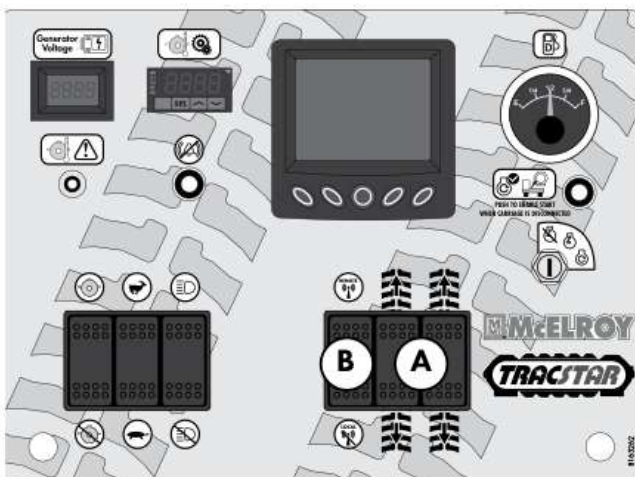


crawl mode off

Crawl mode is used to move the machine slowly and make fine steering adjustments.

IMPORTANT: The tracks may not have sufficient torque to turn the machine in all ground conditions when in the high speed/low torque setting. If so, switch to the low speed/high torque setting.

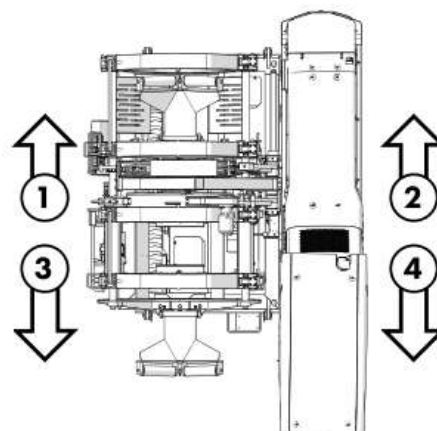
IMPORTANT: The remote will auto power off if left idle for more than 10 minutes.



CD01465-08-01-16



PH05453-01-11-16



**Operator Position
(Rear)**

Operation

Electrical Power (MegaMc)

⚠ WARNING

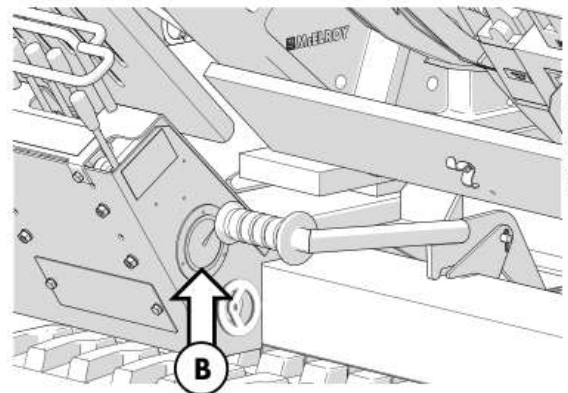
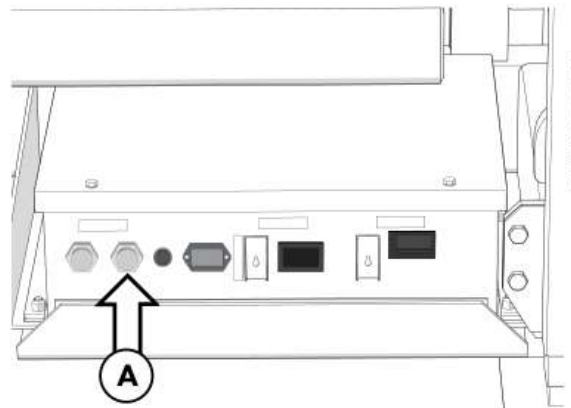
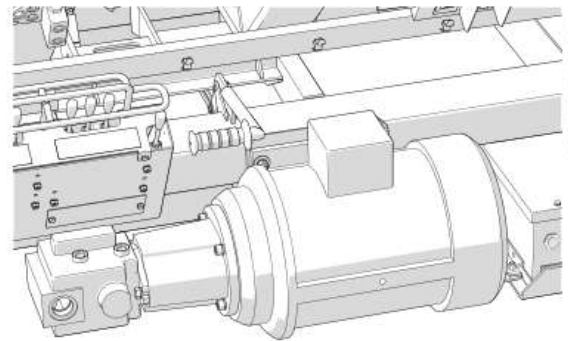
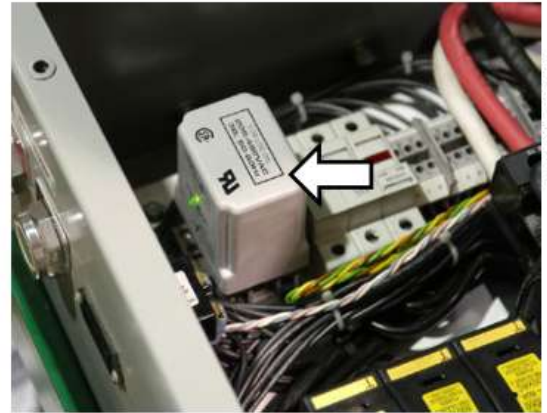
Always ensure equipment is properly grounded. It is important to remember that you are working in a wet environment with electrical devices. Proper ground connections help to minimize the chances of an electric shock.

NOTICE: Low voltage will damage unit. Connect unit to proper electrical power source. Ensure proper ground for electrical system.

With the machine properly connected to the electrical power source, press the Motor Start button on the control panel box **(A)**.

If unit fails to start, the legs of the power leads may be reversed. Refer to the Maintenance section for troubleshooting.

With the hydraulic pump on and no hydraulic functions operational, system pressure gauge reading should be 2300 psi **(B)**.



Operation

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.

Make sure both butt fusion heater plates are properly installed.

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

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



Ensure heater power is off before connecting or disconnecting heater power cables. Failure to do so may result in electrical shock.

TracStar:

Ensure the heater power and RTD cable is plugged in at the heater receptacles on the carriage.

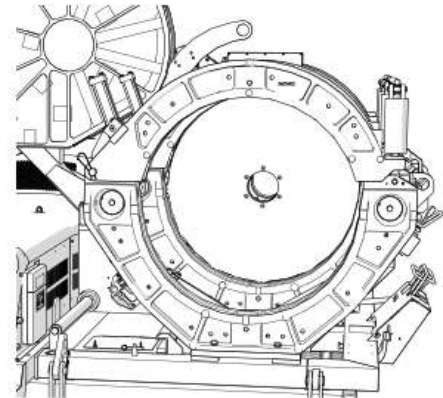
Switch the heater on (A). Adjust heater temperature to required setting (B). Allow heater to warm-up to operating temperature.

IMPORTANT: The engine must be in high speed to power the heater.

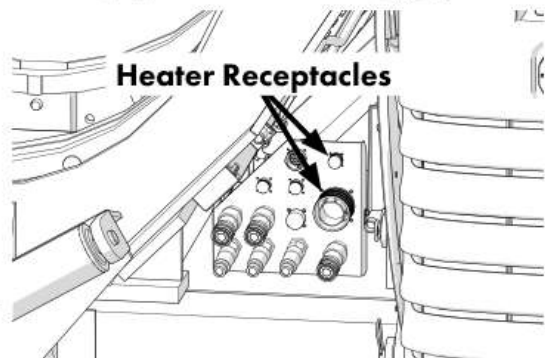
MegaMc:

Ensure the heater power and RTD cable is plugged in at the heater receptacles on the carriage.

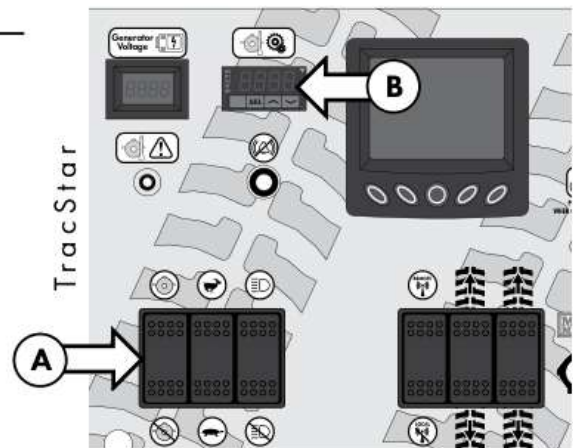
Switch heater on (C). Adjust heater temperature to required setting (D). Allow heater to warm-up to operating temperature.



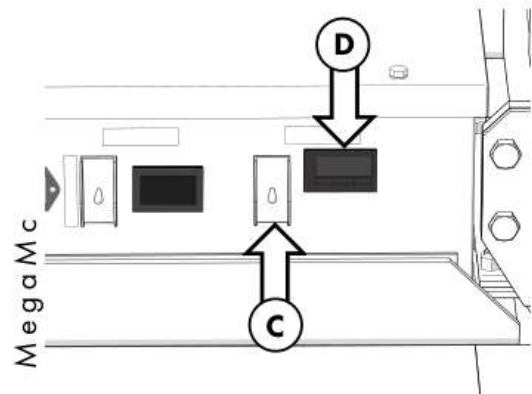
CD01760-07-25-16



CD01647-06-30-16



CD01465-07-25-16



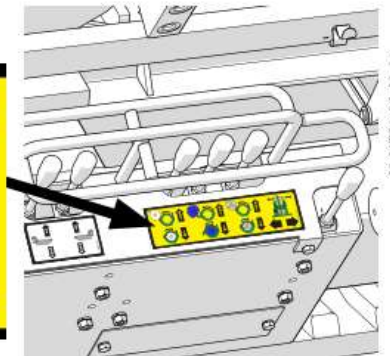
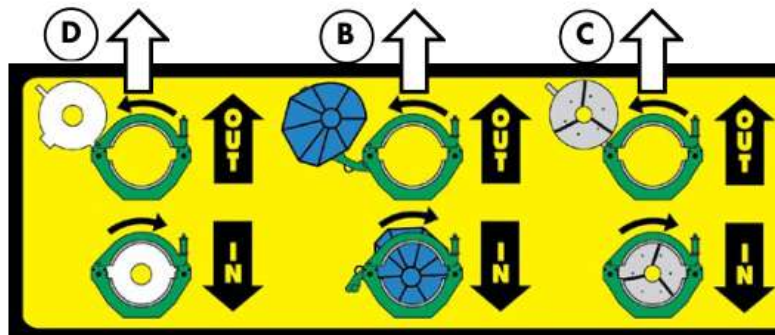
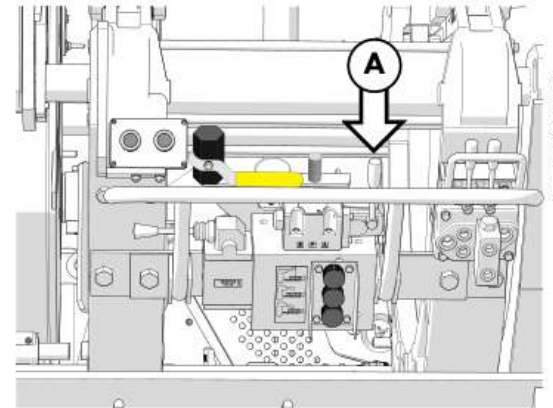
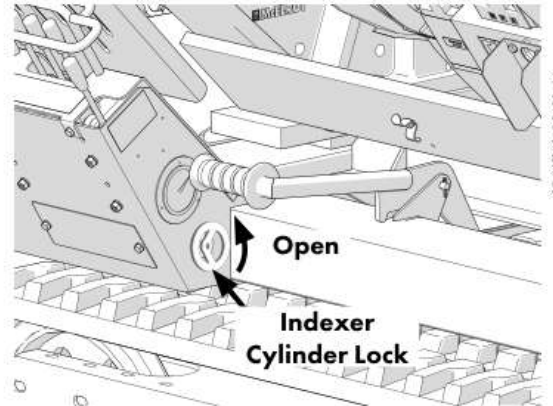
CD02081-07-06-17

Operation

Move Heater and Facer Out

Open Index Cylinder Lock.

- A** Move carriage fully to the right. Carriage pressure may need to be increased to move carriage.
- B** Pivot heater shield frame out by moving the valve lever to out position.
- C** Pivot facer out by moving valve lever to out position.
- D** Pivot heater out by moving valve lever to out position.



Operation

Jaws

Firmly grasp the clamping handle before unclamping.

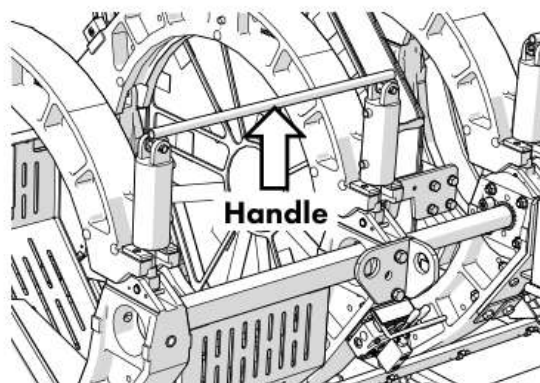
Move jaw clamp valve lever to unclamp position and swing the clamp cylinders out away from the upper jaws.

CAUTION Support the clamping cylinders using the handle when clamping or unclamping the jaws. Clamping cylinders are heavy and could fall causing injury.

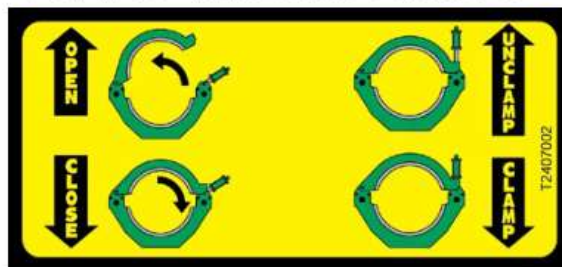
NOTICE: Do not let the clamp cylinders drop. Dropping the cylinders can damage the equipment.

NOTICE: Verify the position of the indexer will not interfere with opening the upper jaws.

Move jaw pivot valve lever to open position to open jaws.



CD01755-07-25-16

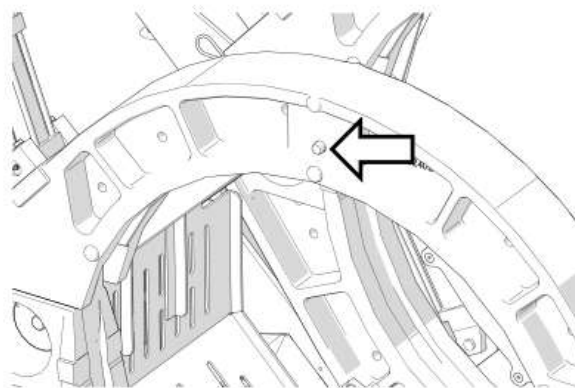


PH05509-05-25-16

TX04908-04-18-16

Jaw Inserts

If required, install appropriate size jaw inserts for the pipe that is being fused. The inserts are held in place by detent pins.



CD01656-05-25-16

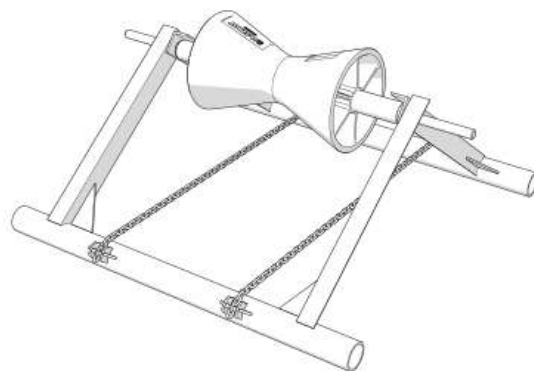
TX01660-04-18-16

Operation

Loading Pipe into Machine

Position pipe support stands slightly more than half the pipe length from each end of the machine to help support and align the pipe.

Raise pipe lifts on the machine to allow pipe to roll into position.



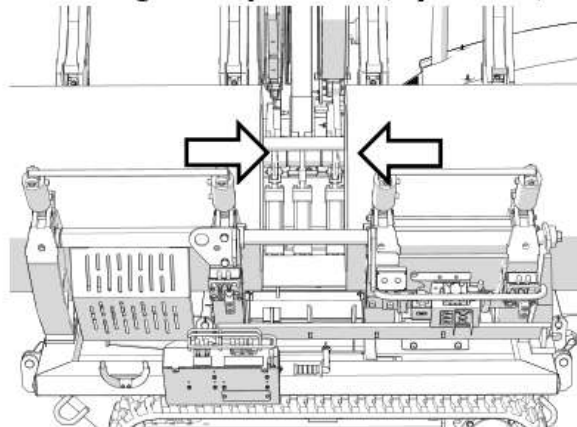
CD01580-02-09-16

Standard Pipe Stand

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



MegaMc Pipe Stand (Hydraulic)



CD01765-07-25-16

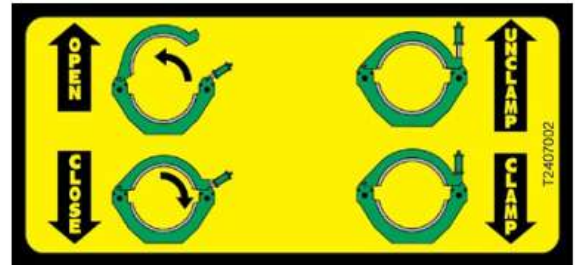
Operation

Closing Jaws

Move the jaw pivot valve lever to Close position.

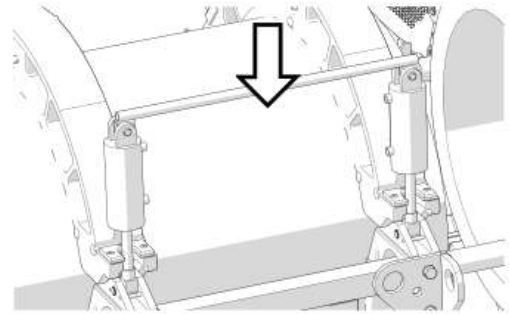
Firmly grasp the clamping handle, move the clamp cylinders into the vertical position and then move the jaw clamp valve lever to the Clamp position.

NOTICE: The jaw clamping cylinders are designed to clamp when in the upright position, evenly applying pressure over the entire base of the cylinder. Always ensure the clamping cylinders are upright over the clamp pads before clamping the jaw. Damage to the cylinder and jaw can occur if not clamped properly. Clamp marks on the bottom of the cylinder are an indication that the cylinder was not in the proper position when clamped down.

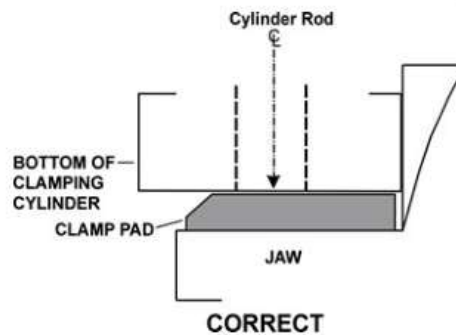


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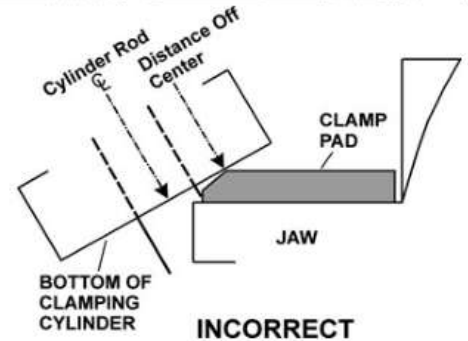
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TX02645-04-18-16



PH04935-3-15-13

PH04934-3-15-13

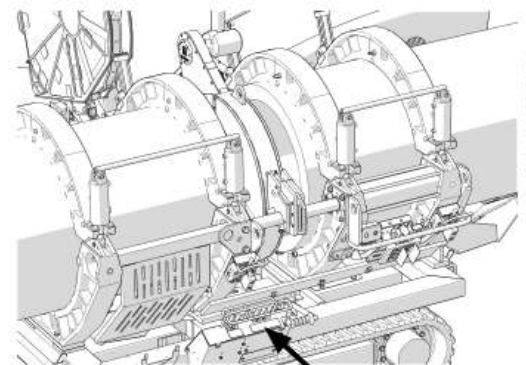
Positioning Facer

Ensure the index cylinder lock is in the open position.

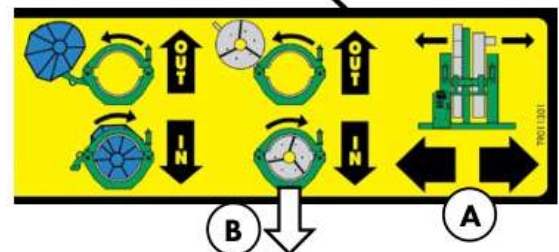
Actuate the indexer valve (A) to position the facer between the pipe ends.

NOTICE: Ensure proper clearance from pipe and jaws for the facer stops before pivoting facer in.

Pivot the facer between the open pipe ends by moving the facer valve to the IN position (B).



CD01766-08-01-16



TX05141-08-01-16

Operation

Begin Facing

Turn facer on by opening valve on top of the facer (TracStar 630/MegaMc 824) or next to the carriage manifold (TracStar 900/MegaMc 1236) **(A)**.

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

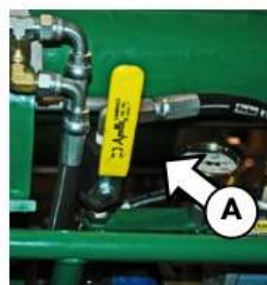
The facing pressure should be set as low as possible while still facing pipe. Excessive facing pressure can damage the facer. It may be necessary to adjust the facing pressure.

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.

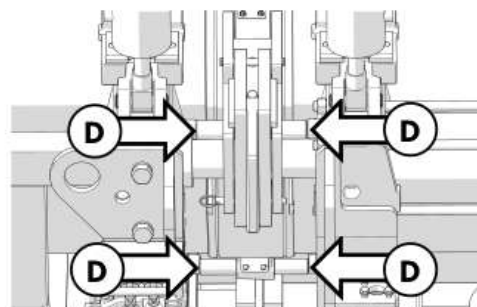
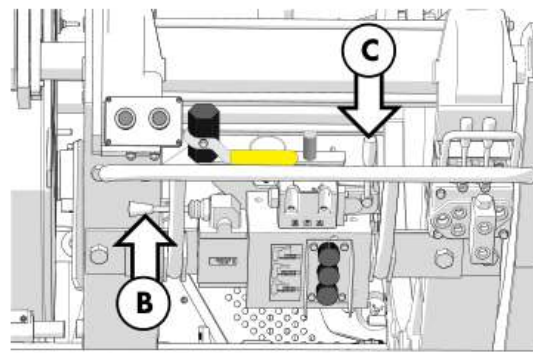
Turn facer off **(A)**.



TracStar 900/MegaMc 1236



TracStar 630/MegaMc 824



PH03278-6-30-06 PH03534-10-17-07

CD01761-07-25-16

CD01660-05-25-16

TX05309-07-06-17

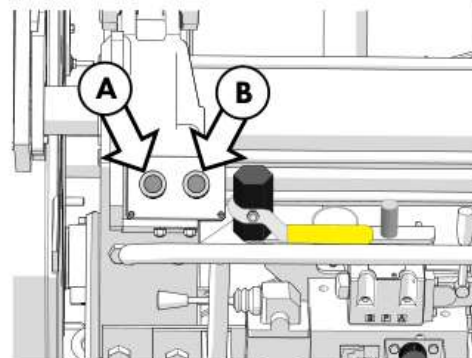
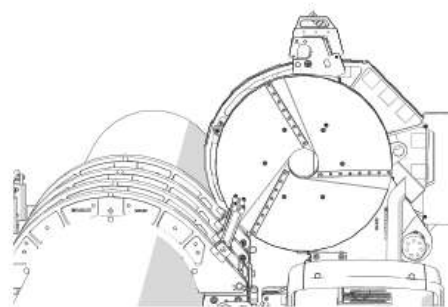
After Facing

Move the carriage directional control to the right and allow the carriage to open completely. Move indexer to the right to center the facer in between the pipe ends to avoid striking facer stops on the pipe ends. Pivot the facer to the out position.

WARNING Use the engine/motor stop **(A)** to turn the hydraulics off before entering the unit for maintenance or chip removal. Death or serious injury could result if the machine 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.

The engine can be restarted by pressing the engine start button **(B)**.



CD01661-05-25-16

CD01761-07-25-16

TX05143-06-03-19

Operation

Check Alignment

Move carriage to the left at facing pressure, until pipe ends contact. Look across the top surface of pipe ends to check alignment. If there is a HI/LO misalignment between pipe ends, adjustments must be made. If HI/LO alignment is acceptable, proceed to "Check for Slippage".

To correct HI/LO misalignment:

CAUTION Support the clamping cylinders by firmly grasping the clamping handle when clamping or unclamping the jaws. Clamping cylinders are heavy and could fall causing injury.

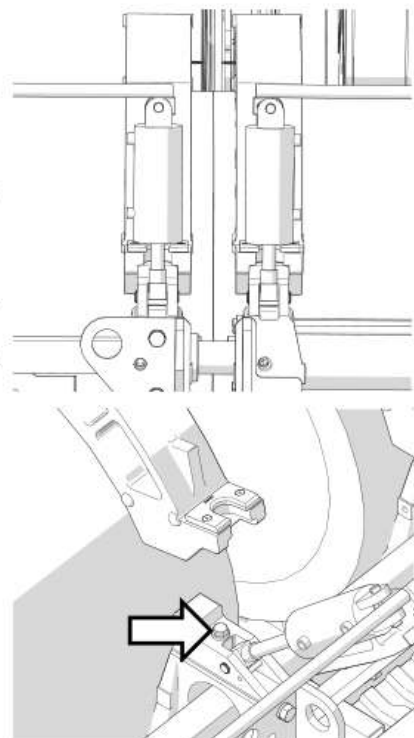
Adjusting bolts are located on top of both inner lower jaws. The jaws must be opened to perform the adjustment. Open the carriage at least 2 inches so pipe ends are not touching. Place carriage directional control in neutral. On the jaw holding the high side pipe only, turn the bolt clockwise on the lower jaw to improve alignment. Close jaws and re-clamp pipe.

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

WARNING Hydraulically operated equipment generates high forces. Anything caught in the machine will be crushed. Keep body parts out of the machine while hydraulics are activated.

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

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



Operation

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

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

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

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



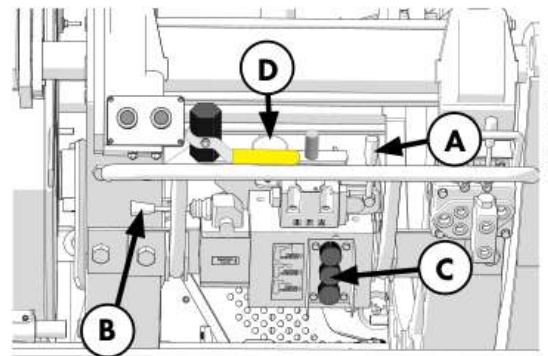
WR00077-4-16-93

TX04913-04-18-16

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 the carriage directional valve to the middle (neutral) position (A).
- 3) Shift the selector valve (B) to the middle heating position, and adjust the heating pressure reducing valve (C) to its lowest pressure by turning the valve counterclockwise completely.
- 4) Shift the carriage directional valve to the left (A).
- 5) Gradually increase the heating pressure by turning the valve clockwise slowly. Increase the pressure until the carriage just begins to move.
- 6) Quickly reduce the heating pressure valve counterclockwise until the carriage is just barely moving.
- 7) View pressure on carriage pressure gauge (D). Record this actual drag pressure.



- A - Carriage Directional Valve
- B - Pressure Selector Valve
- C - Heating Pressure Reducing Valve
- D - Carriage Pressure Gauge

CD01761-07-25-16

TX03023-04-18-16

Operation

Set Fusion Pressure

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

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.

Always add drag pressure to the theoretical fusion pressure.

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



PH04004-8-25-09



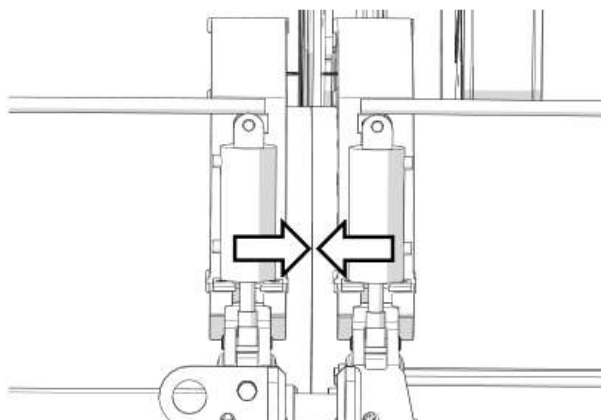
PH05505-04-18-16

TX03024-04-18-16

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**.



CD01663-05-25-16

TX00971-04-18-16

Operation

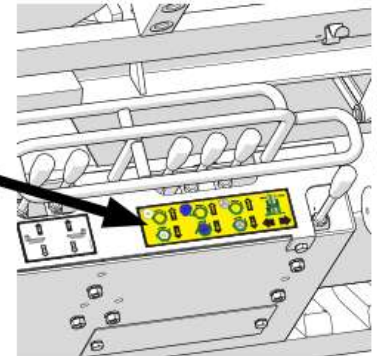
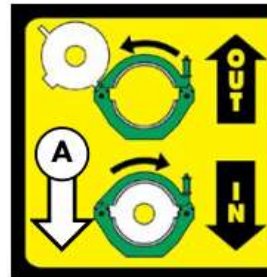
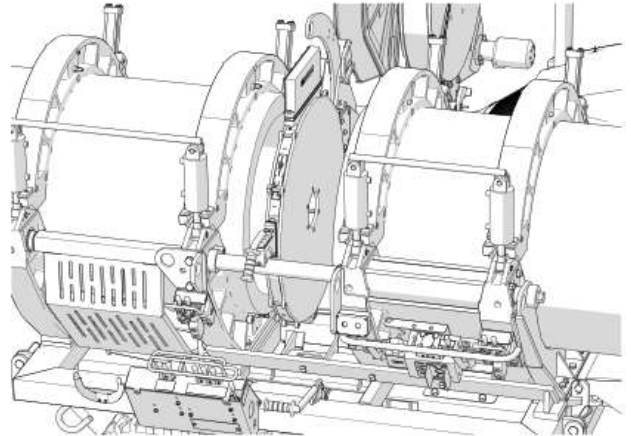
Carriage Indexer Heater Position

Open the carriage completely.

Actuate the index valve to position the heater between the pipe ends.

Pivot the heater between open pipe ends by moving the heater valve to the **IN** position (**A**).

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



TX05144-08-01-16

Cleaning Heater

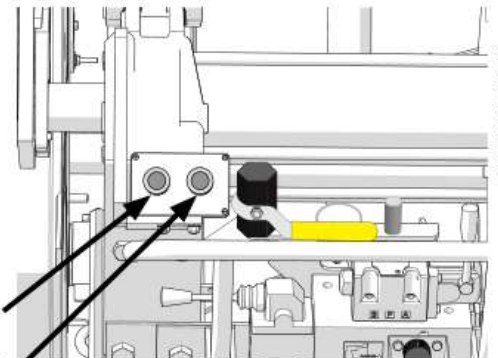
WARNING

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

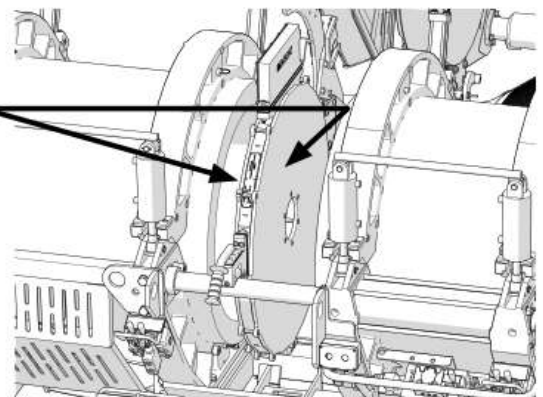
Use a clean dry non-synthetic cloth to clean the butt fusion heater surfaces.

Engine / Motor Stop

Engine / Motor Start



Clean Heater Surfaces



TX04914-04-18-16

Operation

Heat Pipe

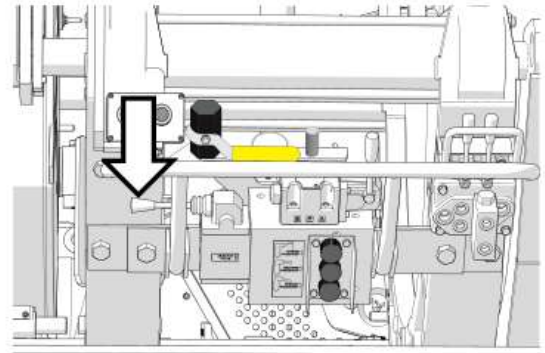
The heating pressure was established during the Determine Drag Pressure section.

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

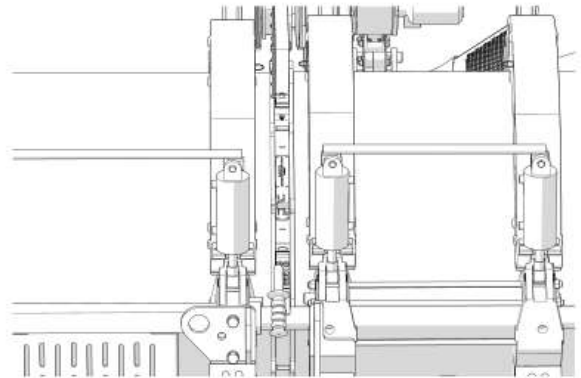
IMPORTANT: A modified shift sequence may be required in certain situations.

Shift the selector valve 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 selector valve 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 valve to neutral after the carriage pressure drops to drag pressure.

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



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CD01665-05-26-16

TX02880-04-18-16

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 valve is in neutral and move selector valve down, to fusing position.

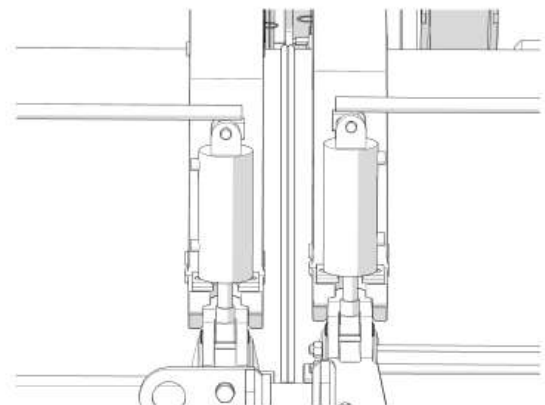
Open the carriage just enough to remove the heater.

Index the heater to the right to clear the pipe ends. Actuate the heater pivot switch to 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.



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TX04915-04-18-16

Operation

Opening Jaws

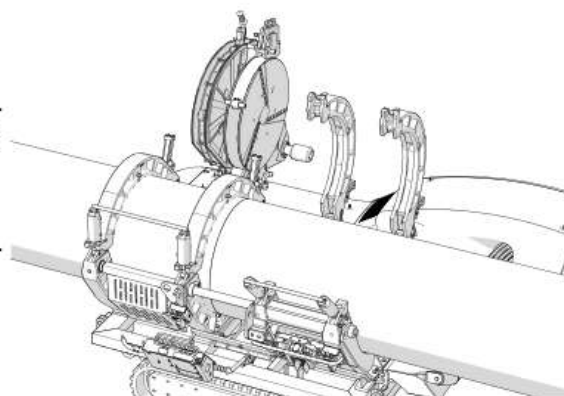
After the fusion process is complete, Shift the carriage directional control to the neutral position.

Move heater and facer completely to the left.

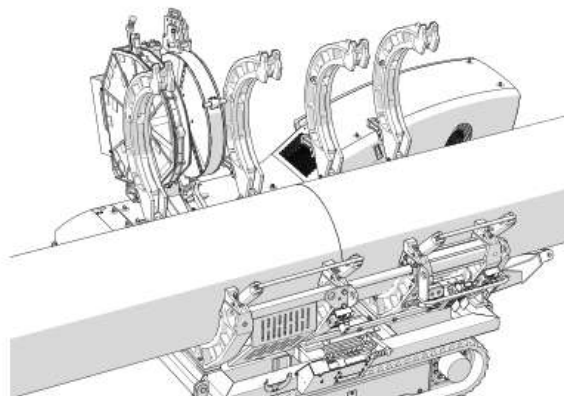
CAUTION Always support the clamping cylinders by firmly grasping the clamping handle when clamping or unclamping the jaws. Clamping cylinders are heavy and could fall causing injury.

For each set of jaws, fixed and movable, while holding the clamp cylinder handles, unclamp jaws and rotate the clamping cylinders out.

Open the jaws.



CD01768-07-28-16



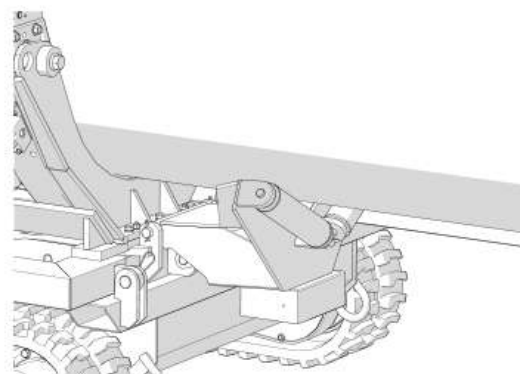
CD01769-07-28-16

TX05078-06-28-16

Raise Pipe

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

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



CD01669-05-26-16

TX01681-04-18-16

Operation

Position Pipe for Next Joint

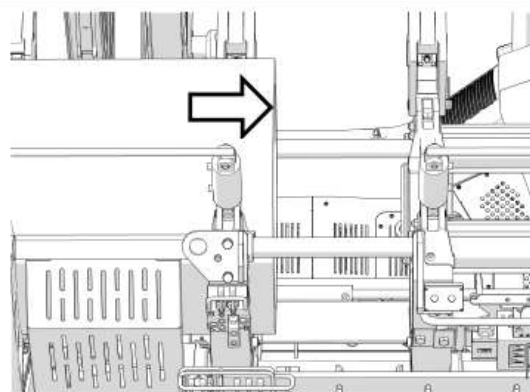
Position pipe with enough material protruding past the inner fixed jaw face to allow for complete facing of the pipe end.

TracStar:

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.

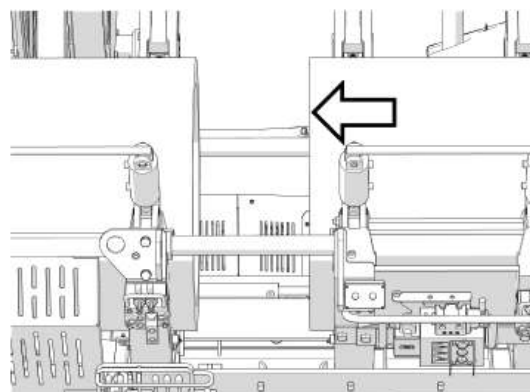


TX04917-04-18-16

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

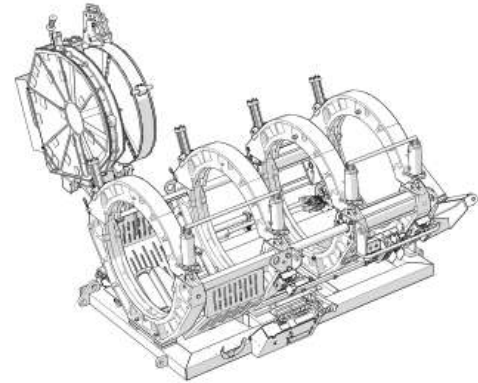
Special Operations

Special Operations Overview

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

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

Using the heater and facer off of the indexer for top loading into the carriage requires the in-ditch heater/facer stand.



CD01772-07-28-16

The Special Operations section is divided into:

- 4-Jaw Carriage Removal - Includes the complete 4-Jaw carriage. The heater and facer can be used on the indexer or disconnected from indexer and top loaded.
- Outer Fixed Jaw Removal - Includes the 4-Jaw skid and allows more area to fuse tees or perform tie-ins easier. The heater and facer can be used on the indexer or disconnected from indexer top loaded.
- 3-Jaw Carriage Removal - For more compact off vehicle fusion operation. The heater and facer must be removed from the indexer and top loaded into the carriage during 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.
- Remove Upper Jaws - For maneuvering the carriage around pipe in tight working spaces.
- 3-Jaw Carriage Tee Leg Length - Modification to achieve the minimum length of tee branch.

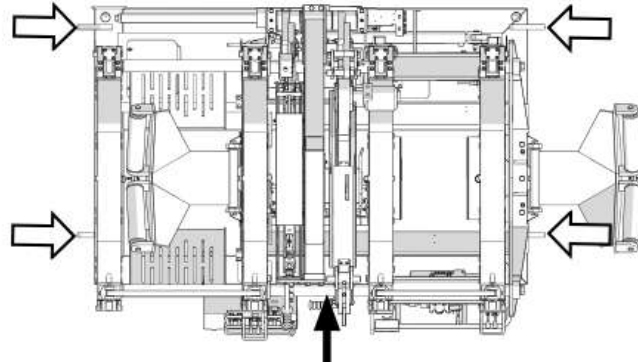
Special Operations

4-Jaw Carriage Removal

Ensure heater and facer are pivoted into the stowage position between the inner jaws.

Turn machine power off.

Remove the four clevis pins at carriage base.



Heater/Facer Stowage Position
Operator Side



Ensure heater power is off before connecting or disconnecting heater power cables. Failure to do so may result in electrical shock.

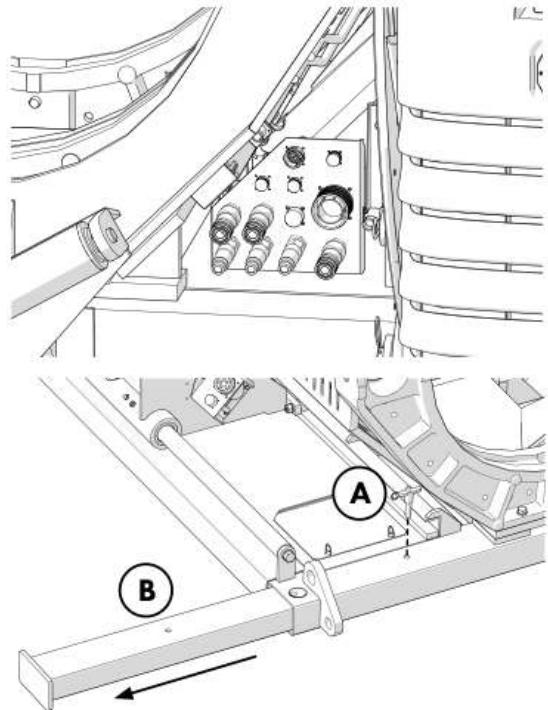
Disconnect all carriage hoses and cables using quick disconnects on the carriage.

Refer to the Lifting 4-Jaw Carriage section of this manual for instructions for lifting the 4-jaw carriage.

Remove the detent pin (A) and extend carriage skid outrigger (B) under the outer fixed jaw. Reinstall the detent pin (A) into the skid with outrigger in open position.

NOTICE: The carriage skid outrigger must be extended to prevent the 4-jaw carriage from tipping over and damaging the carriage when heater, facer, and jaws are pivoted out.

Attach extension kit (cables and hoses) between carriage and vehicle.



Special Operations

Outer Fixed Jaw Removal

Certain fusion applications require more clearance than is available in the 4-jaw carriage. When needed, the outer fixed jaw can be removed from the 4-jaw carriage while leaving the rest of the carriage skid assembly intact.

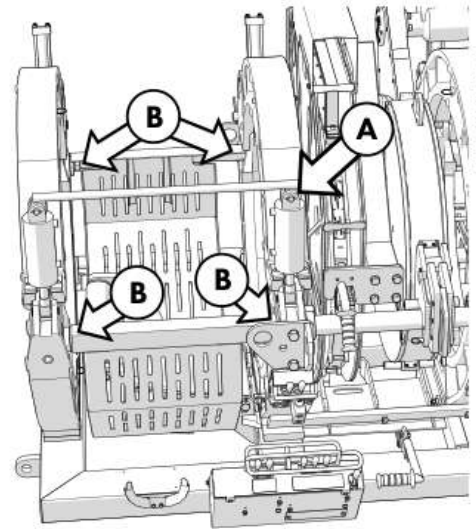
To remove the outer fixed jaw:

Remove all the inserts from the upper and lower jaws.

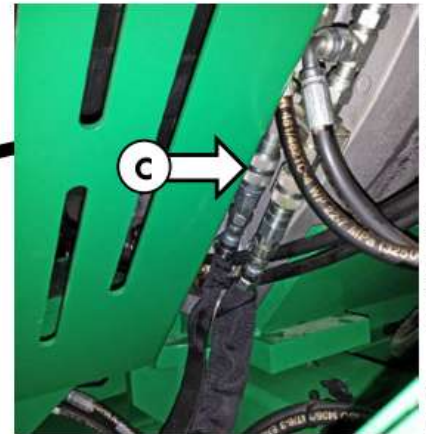
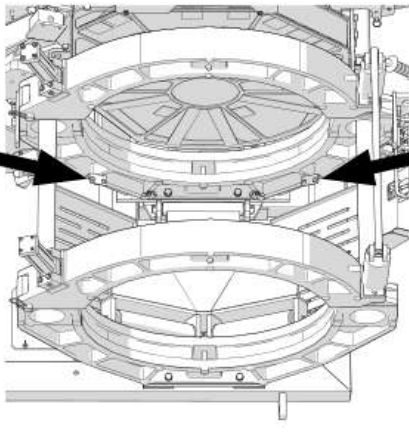
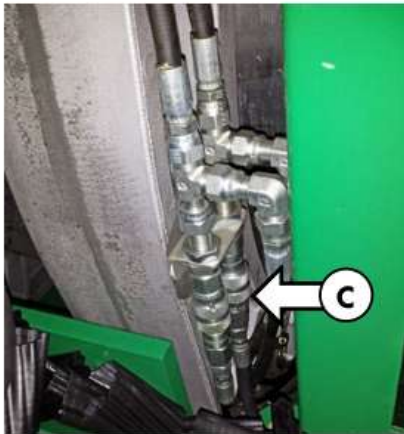
Ensure the outer fixed jaw is closed and clamped.

Turn machine power off.

- A** Disconnect the clamp handle on the inner fixed jaw.
- B** Unbolt and remove both fixed jaw braces with guards.
- C** Remove the hydraulic hoses between the jaws using the quick disconnects.



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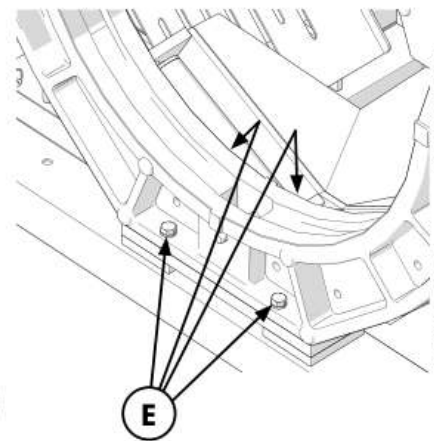
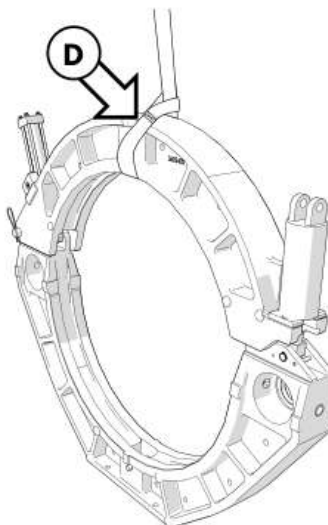


PH05513-03-26-16
CD01676-05-26-16
PH05514-05-26-16

- D** Connect a lifting strap of appropriate load rating to the upper jaw. Attach the lifting strap to lifting equipment. Remove the slack from the lifting strap to support the jaw assembly once it is unbolted.

- E** Remove the four bolts securing the outer fixed jaw to the 4-jaw skid and lift the jaw.

Reverse procedure to re-attach the outer fixed jaw.



CD01677-05-26-16
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Special Operations

3-Jaw Carriage Removal

Facer Removal

When operating the fusion machine in the 3-Jaw carriage configuration, the facer must be removed from the indexer pivot.

⚠ 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.

To remove the facer from its indexer pivot arm:

Turn off the machine.

Ensure the facer handle is pinned in the open position (A).

Attach a lifting strap of adequate load rating to the lifting eye on the top of the facer (B).

Disconnect the hydraulic hoses to the facer motor (C).

Remove the slack from the lifting strap to support the facer once it is unbolted.

Remove the (2) facer pivot arm mounting bolts (D).

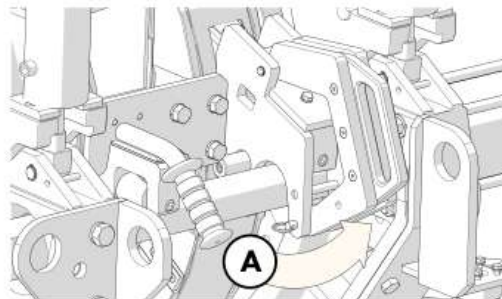
Slowly lift the facer out using an overhead lifting device.

IMPORTANT: Lifting the heater/facer in and out may cause the heater/facer to spin around, use the handle to assist with handling.

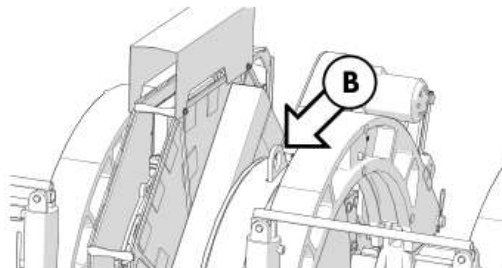
TracStar 900/MegaMc 1236 Facer Setup:

Remove the rest button (E).

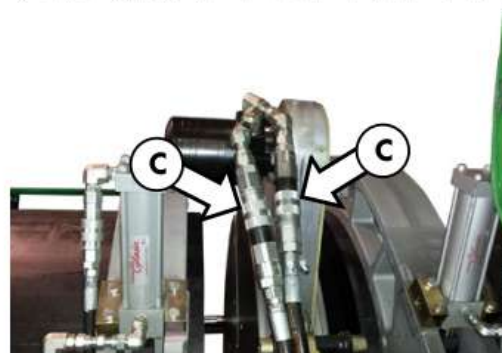
Remove the facer guide rod bracket assembly (F) from the facer assembly by removing the mounting bolts (G).



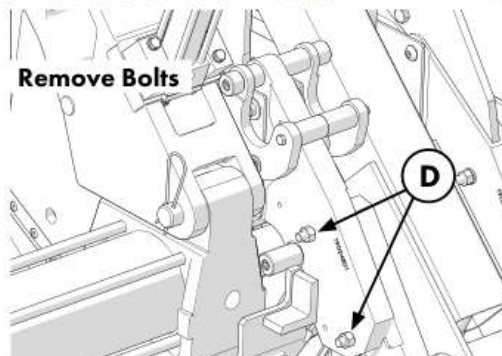
CD01679-06-01-16



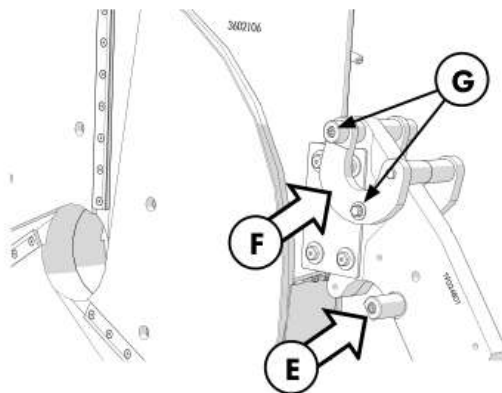
CD01680-06-30-16



PH0515-06-01-16



CD01681-06-30-16



CD01682-06-30-16

Special Operations

3-Jaw Carriage Removal (continued)

Attach the facer guide rod bracket assembly (F) to the rear of the facer using the mounting bolts (G).

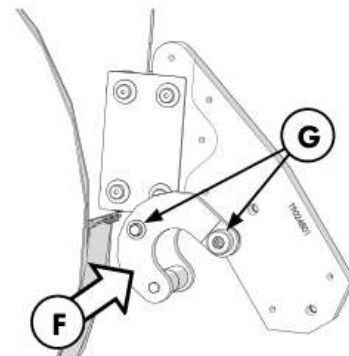
Install the rest button (E) removed earlier to the location shown on the facer pivot arm.

Attach the hydraulic extension hoses from the in-ditch extension kit to the facer motor and connect the other end to the vehicle.

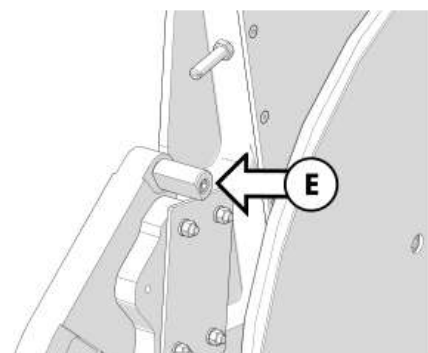
When the facer is not being used, store the facer in the heater/facer stand.

Perform the facer removal steps in reverse to re-install the facer onto the indexer pivot arm.

NOTICE: Remove the facer guide rod bracket assembly and re-install in the storage location before reinstalling on the indexer pivot arm.



CD01683-06-01-16



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TracStar 630/MegaMc 824 Facer Setup:

Remove the rest buttons (H).

Remove the facer guide rod bracket assembly (J) from the facer assembly by removing the mounting bolts (K).

Attach the facer guide rod bracket assembly (J) to the rear of the facer using the mounting bolts (K).

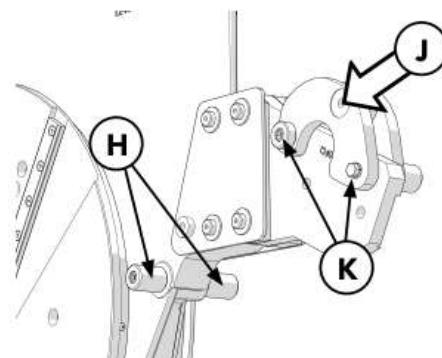
Install the rest buttons (H) removed earlier to the location shown on the facer pivot arm with the short rest button on the end of the pivot arm.

Attach the hydraulic extension hoses from the in-ditch extension kit to the facer motor and connect the other end to the vehicle.

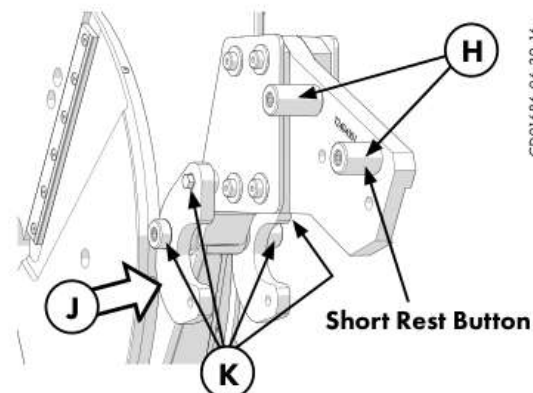
When the facer is not being used, store the facer in the heater/facer stand.

Perform the facer removal steps in reverse to re-install the facer onto the indexer pivot arm.

NOTICE: Remove the facer guide rod bracket assembly and re-install in the storage location before reinstalling on the indexer pivot arm.



CD01685-06-02-16



CD01686-06-30-16

Special Operations

3-Jaw Carriage Removal (continued)

Heater Removal

Start the machine, pivot the heater shield out and ensure the heater is pivoted in.

Turn machine off.

Verify the heater is turned off and cool.

⚠ WARNING Ensure heater power is off before connecting or disconnecting heater power cables. Failure to do so may result in electrical shock.

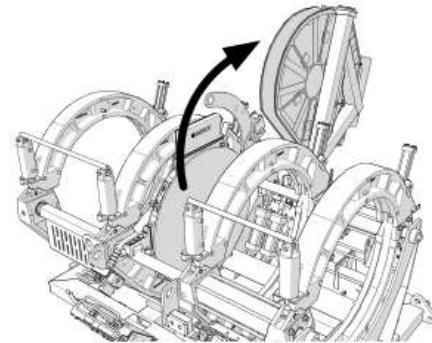
Unplug the heater power and RTD cables at the heater receptacles **(A)**.

Attach a lifting strap of adequate load rating to the lifting arm attached to the heater **(B)**.

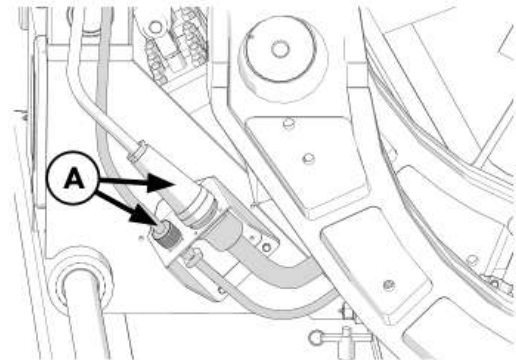
Remove the slack from the lifting strap to support the heater once it is unbolted.

Remove the (2) heater mounting bolts **(C)**.

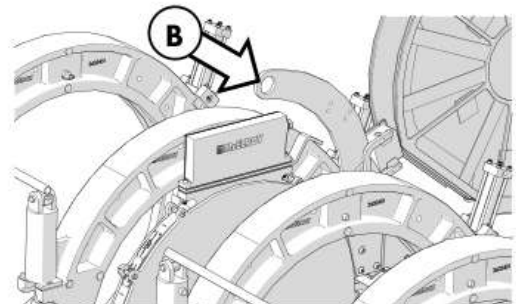
Lift the heater clear of the machine.



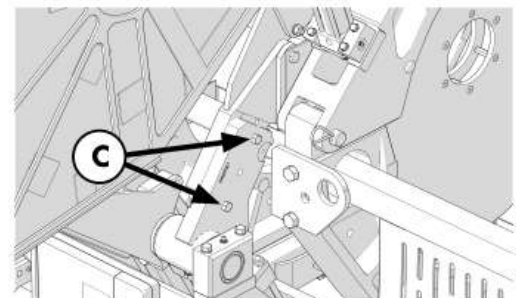
CD01775-07-28-16



CD01712-06-30-16



CD01688-06-30-16



CD01689-06-30-16

Special Operations

3-Jaw Carriage Removal (continued)

The top loading heater must have a stripper bar installed so that the heater can be stripped off pipe ends quickly and efficiently during the fusion process.

Remove the stripper bar assembly (D) and braces from the storage location on heater shield arm and install onto heater as shown (E).

WARNING Ensure heater power is off before connecting or disconnecting heater power cables. Failure to do so may result in electrical shock.

Attach heater power and RTD cables between the vehicle and heater using the extension kit.

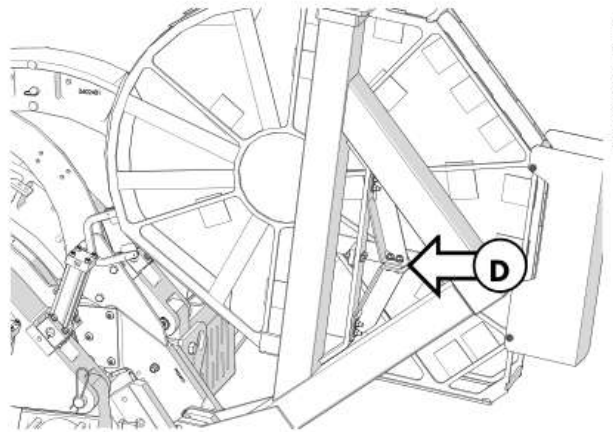
CAUTION The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand or frame when not in use, and use care when heating the pipe.

IMPORTANT: Lifting the heater/facer in and out may cause the heater/facer to spin around, use the handle to assist with handling.

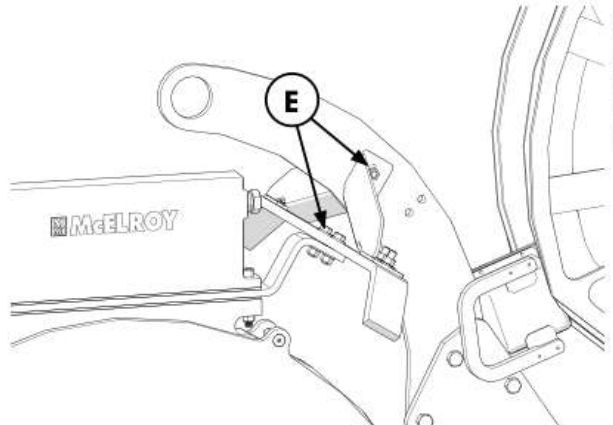
Store the heater in the heater/facer stand when the heater is not in use.

Perform the heater removal steps in reverse to re-install the heater onto the indexer pivot arm.

NOTICE: Remove the stripper bar before re-installing heater onto indexer pivot arm.



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Special Operations

3-Jaw Carriage Removal (continued)

Carriage Removal:

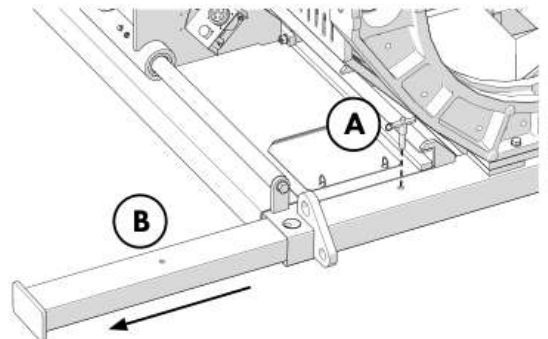
Remove all inserts from the jaws of the carriage.

NOTICE: If the 4-jaw carriage has been removed from the vehicle, the carriage skid outrigger must be extend to prevent the skid from tipping over and damaging the carriage.

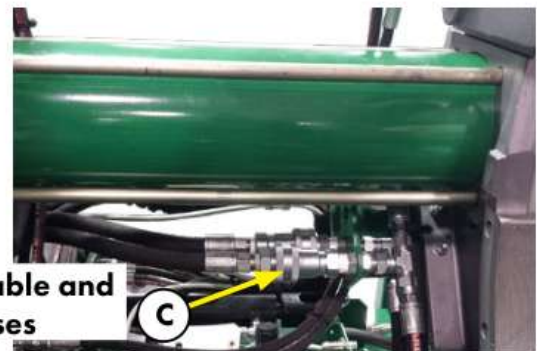
Extend the skid outrigger from the 4-jaw skid by pulling the detent pin (A) and sliding the outrigger out (B) and inserting the pin to lock the open position.

With the machine turned off and the heater shield pivoted out:

Disconnect hoses and cable between the 4-jaw carriage and the 3-jaw carriage assembly (C).



CD01674-05-26-16



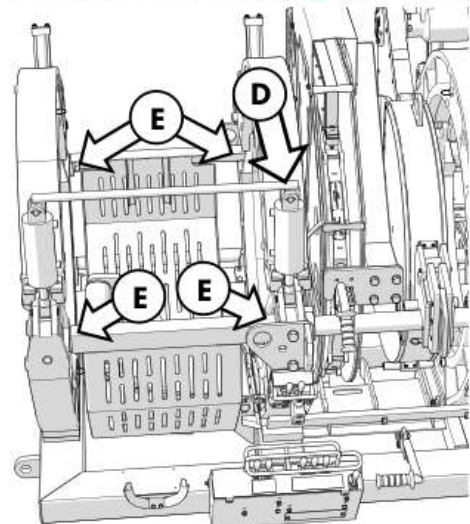
PH05610-06-30-16

Disconnect cable and hydraulic hoses

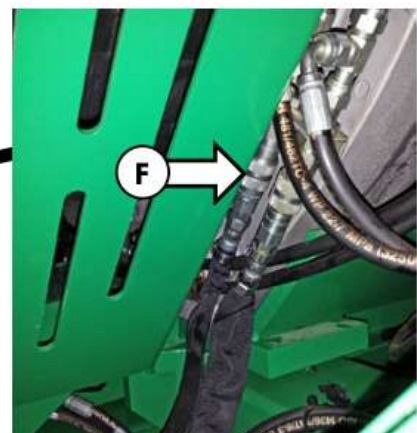
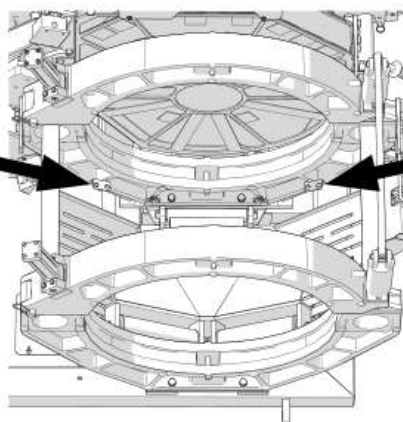
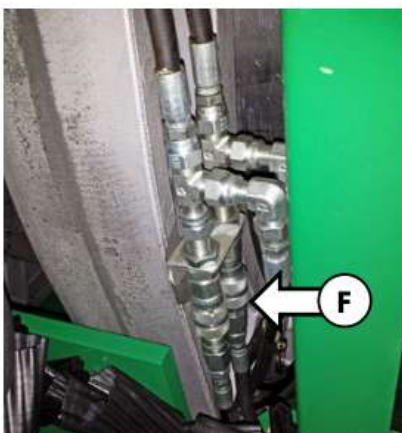
Disconnect the clamp handle on the inner fixed jaw (D).

Unbolt and remove both fixed jaw braces with guards (E).

Remove the hydraulic hoses between the jaws using the quick disconnects (F).



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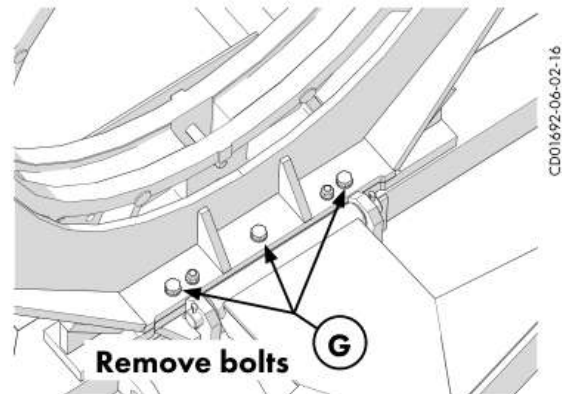
CD01676-05-26-16

PH05514-05-26-16

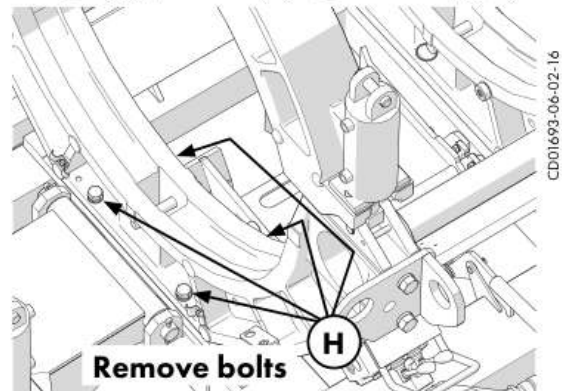
Special Operations

3-Jaw Carriage Removal (continued)

Remove (3) outer guide rod support mounting bolts (**G**).

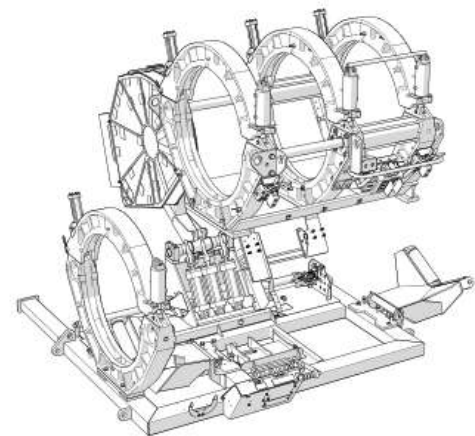


Remove (4) inner fixed jaw mounting bolts (**H**).



Refer to the Lifting 3-Jaw Carriage section of this manual for instructions for lifting the 3-jaw carriage.

Perform the carriage removal steps in reverse to re-install the 3-jaw carriage onto the 4-jaw carriage assembly.



Special Operations

Remove Upper Jaws

Attach a lifting strap to the upper jaw.

Open the jaw enough to access the pivot cylinder pin (A).

Remove any slack in the lifting strap.

Turn off the machine.

Disconnect the pivot cylinder hoses.

CAUTION Do not place fingers into the pivot pin hole at any time during pivot pin removal. Moderate to minor injury could occur.

Remove the pivot cylinder pin (A) and the upper jaw pivot pin (B).

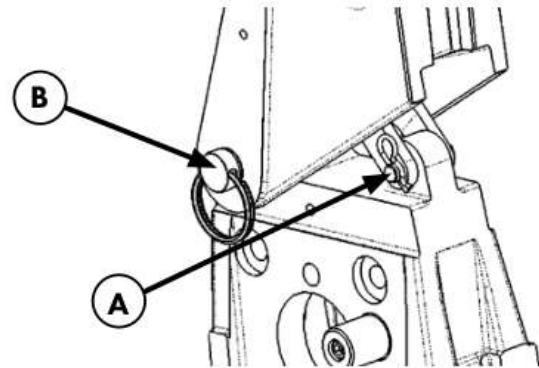
Lift the upper jaw from the carriage.

Repeat to remove the other upper jaws.

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

Reverse these steps to reattach the upper jaws.

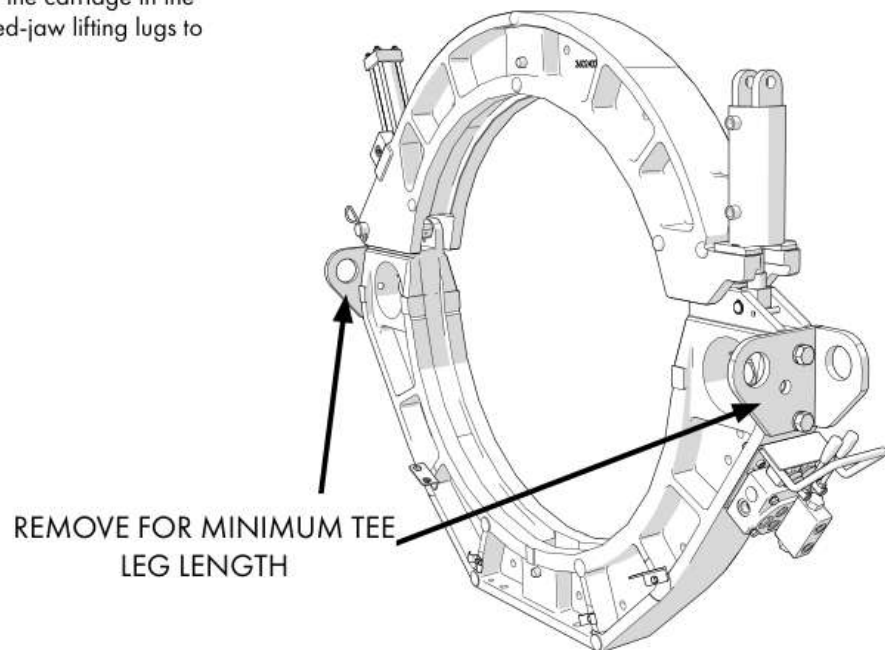
TX05088-07-07-16



PH03448-1-22-07

3-Jaw Carriage Tee Leg Length

With the outer fixed jaw removed, or with the carriage in the 3-Jaw configuration, remove the inner fixed-jaw lifting lugs to achieve the minimum tee leg length.



CD01695-06-30-16

TX05089-07-07-16

Lifting

Lifting Safety

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

⚠ WARNING

Safety warnings:

1. Do not exceed rated load or lift loads greater than the rated load of the lifting device.
2. Do not operate a damaged or malfunctioning lifting device.
3. Do not lift persons.
4. Do not lift a suspended load over persons.
5. Do not leave a suspended load unattended.
6. Do not remove or obscure warning labels.
7. Read and understand the lifting device operator's manual before use.
8. Stay clear of the suspended load.
9. Lift loads only as high as necessary.
10. Do not alter or modify the lifting device.
11. Employ generally accepted safe lifting practices.
12. Do not shock or impact load the lifting device.
13. Inspect all lifting pins for damage.



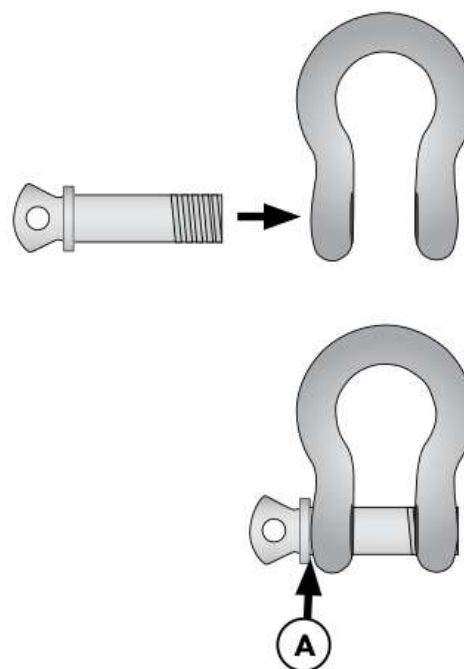
TX04250-04-18-16

SAFE13-12-14-92

WR00014-3-B-93

Lifting Device Shackles

The McElroy lifting device utilizes screw pin type anchor shackles for sling attachment points. When installing the shackle screw pin to attachment points, always ensure the screw pin bottoms out completely on its shoulder stop **(A)** before lifting.



TX05090-06-28-16

WR00014-3-B-93

Lifting

Lifting Entire TracStar® Machine

Lifting device configuration shown is for lifting the entire TracStar machine including the carriage.

NOTICE: Never use this lifting device for any other purpose. You could damage the lifting device and machine.

Ensure the heater and facer are in the stowage position between the two inner jaws.

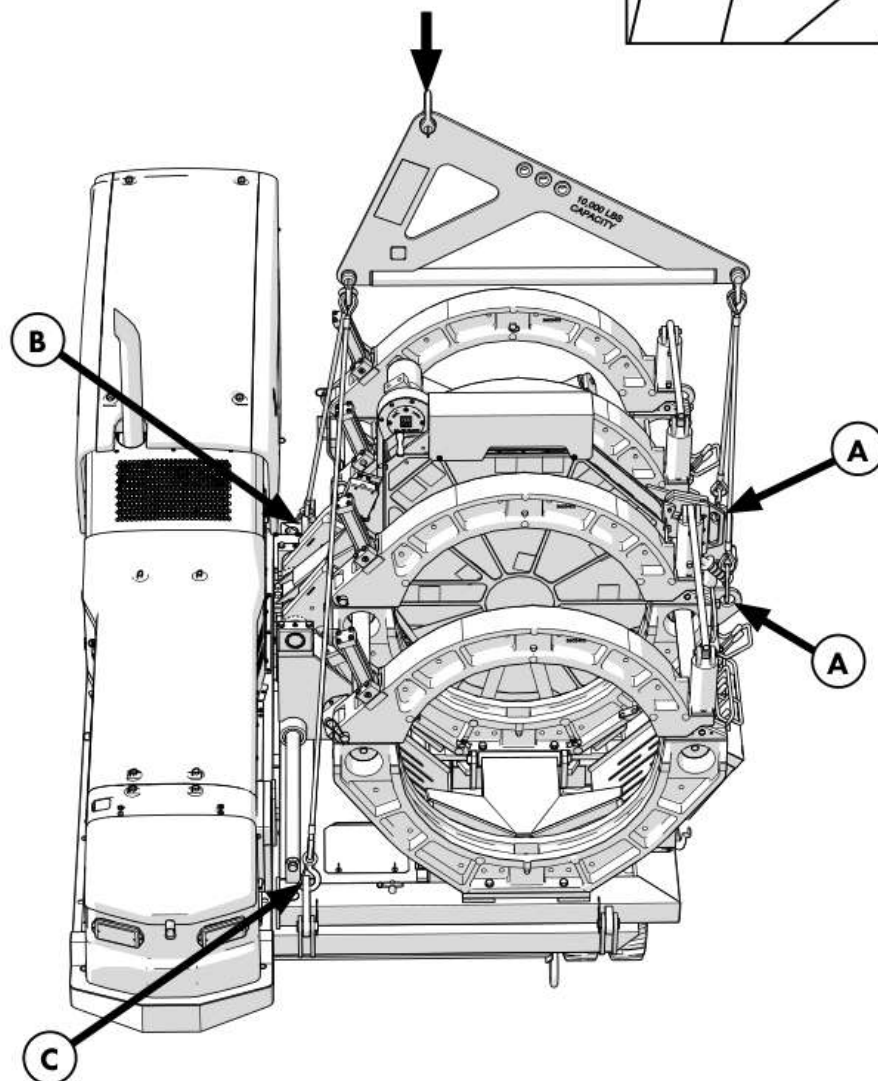
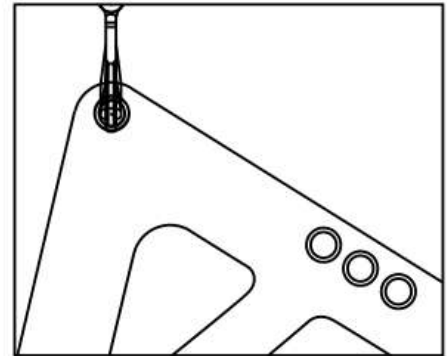
Attach the lifting equipment to the lifting device at hook position shown.

Attach the two 47" short cables (**A**) to the lift points on the operator side of the machine.

Attach the 76" (1930mm) cable (**B**) to the lift point on the carriage skid.

Attach the 84" (2134mm) cable (**C**) to the lift point on the carriage skid.

Lift the entire TracStar machine.



CD00763-06-02-16

CD01696-06-02-16

Lifting

Lifting Entire Rolling Machine

Lifting device configuration shown is for lifting the entire Rolling machine including the carriage.

NOTICE: Never use this lifting device for any other purpose. You could damage the lifting device and machine.

Ensure the heater and facer are in the stowage position between the two inner jaws.

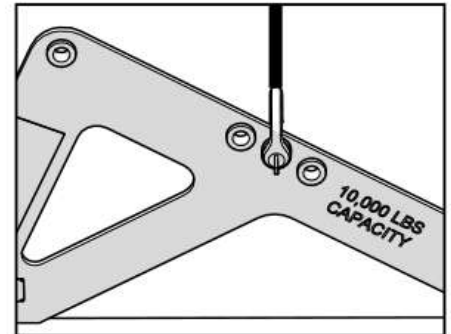
Attach the lifting equipment to the lifting device at hook position shown.

Attach the two 47" short cables (**A**) to the lift points on the operator side of the machine.

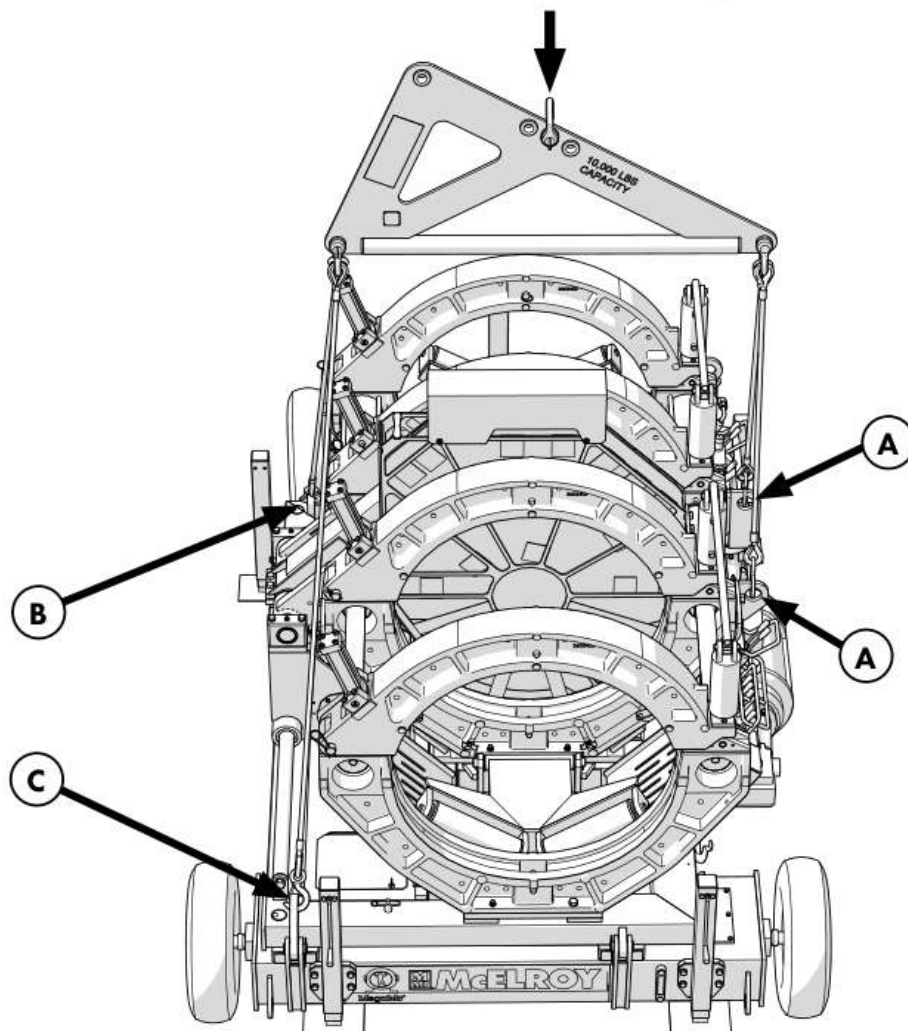
Attach the 76" (1930mm) cable (**B**) to the lift point on the carriage skid.

Attach the 84" (2134mm) cable (**C**) to the lift point on the carriage skid.

Lift the entire Rolling machine.



CD02083-07-05-17



CD02083-07-05-17

Lifting

Lifting 4-Jaw Carriage

Refer to Special Operations section for instructions on disconnecting 4-jaw carriage from vehicle.

Lifting device configuration shown is for lifting the 4-jaw carriage.

NOTICE: Never use this lifting device for any other purpose. You could damage the lifting device and machine.

Ensure the heater and facer are in the stowage position between the two inner jaws.

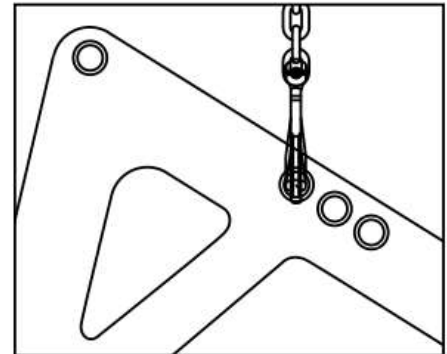
Attach the lifting equipment to the lifting device at hook position shown.

Attach the two 47" short cables (**A**) to the lift points on the operator side of the machine.

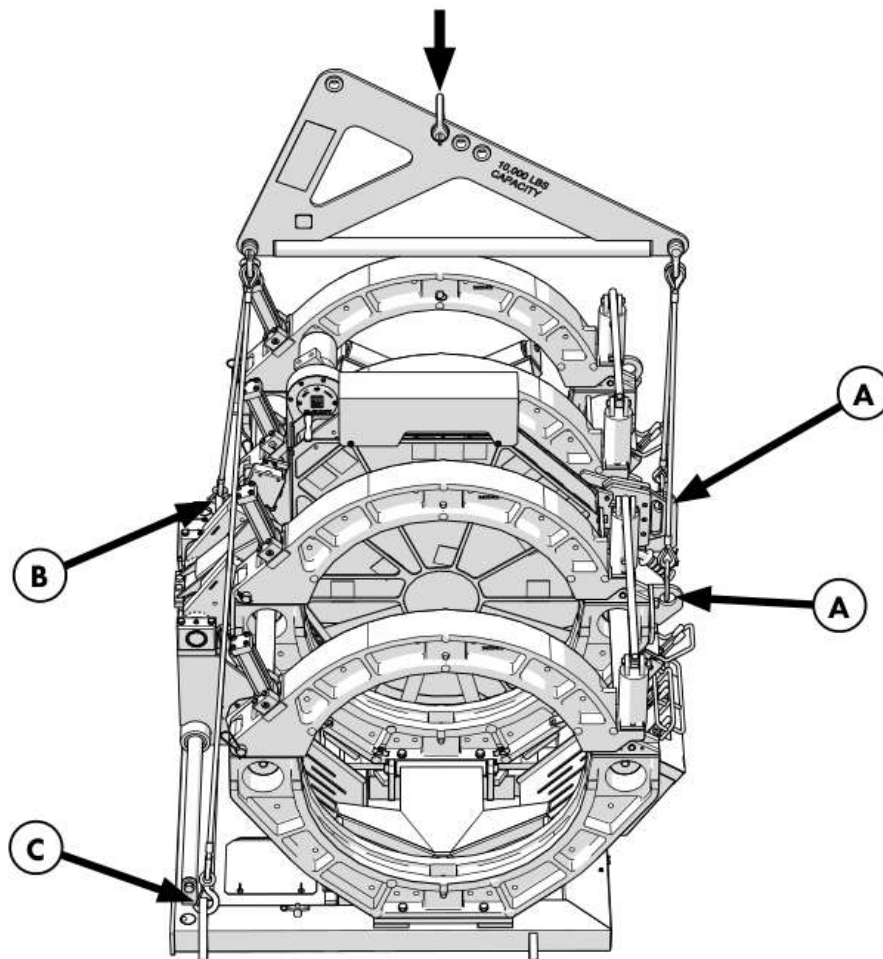
Attach the 76" (1930mm) cable (**B**) to the lift point on the carriage skid.

Attach the 84" (2134mm) cable (**C**) to the lift point on the carriage skid.

Lift the 4-jaw carriage.



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CD01697-06-02-16

Lifting

Lifting 3-Jaw Carriage

Refer to Special Operations section for instructions on disconnecting 3-jaw carriage from vehicle.

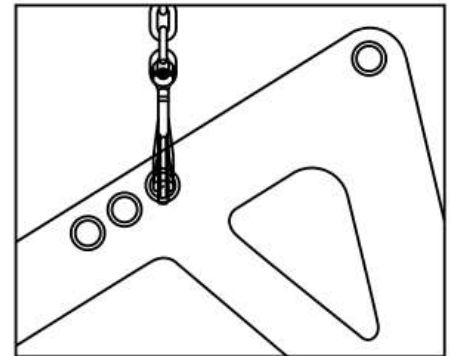
Lifting device configuration shown is for lifting the 3-jaw carriage.

NOTICE: Never use this lifting device bar for any other purpose. You could damage the lifting device and machine.

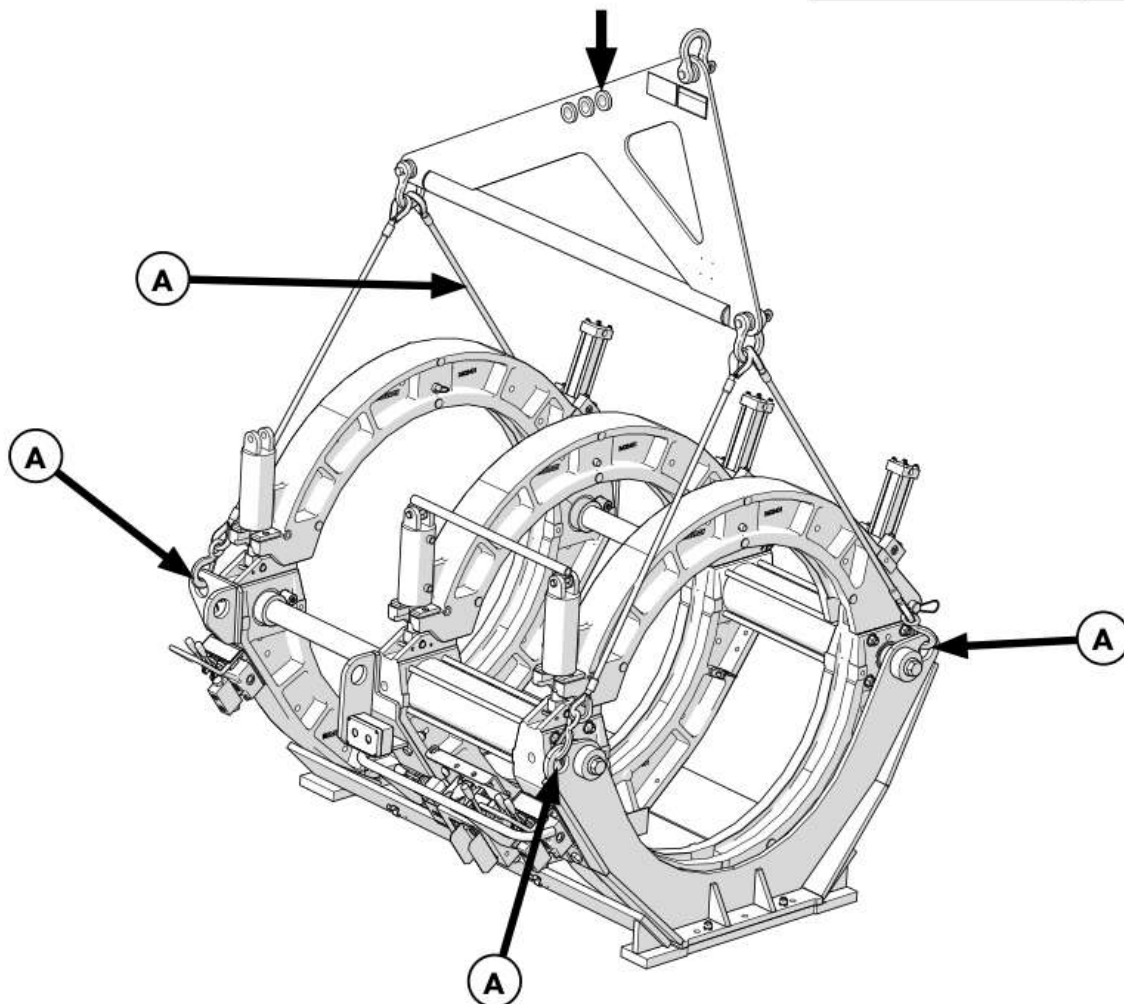
Attach the lifting equipment to the lifting device at hook position shown.

Attach the four 47" short cables (**A**) to the lift points on the each corner of the carriage.

Lift the 3-jaw carriage.



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CD01777-07-29-16

Transport Machine

Securing Indexer for Transport

Secure the indexer prior to transport to safeguard against machine damage.

NOTICE: Do not close carriage against heater/facer support bracket. The support bracket is not intended to have carriage force applied to it, damage to the support bracket will occur. The support bracket is not a safety device.

To properly secure the indexer into the stowage position:

Open the carriage completely. Position the indexer so that the heater and facer are between the inner jaws of the carriage.

Raise the heater/facer support bracket using the handle on the base of the carriage.

Pivot heater onto support bracket, then pivot the facer and heater shield into the carriage between the two inner jaws.

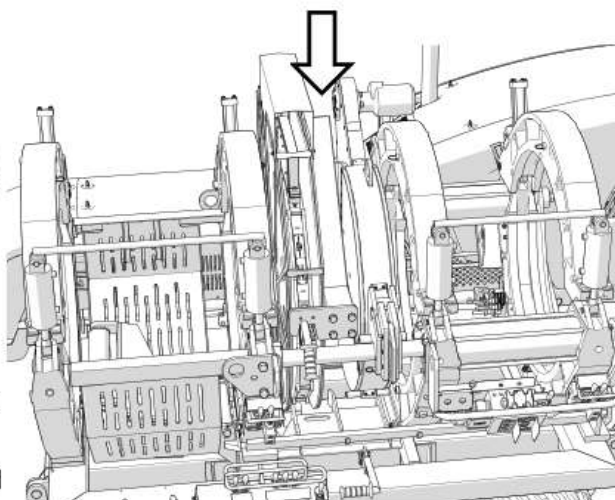
Turn off the machine.



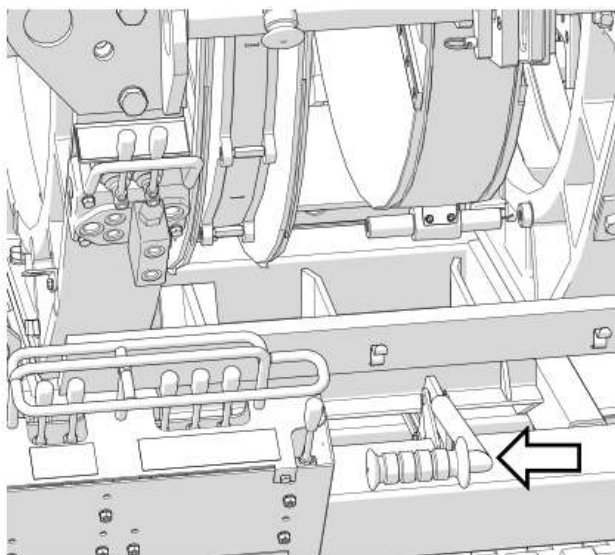
WARNING Hydraulically operated equipment generates high forces. Anything caught in the machine will be crushed. Keep body parts out of the machine while hydraulics are activated.

Secure the heater and facer down with a ratchet strap to help prevent movement during transport.

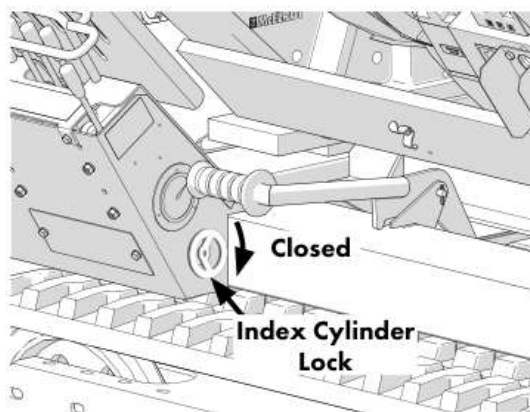
Close the index cylinder lock to prevent the indexer from movement.



CD01778-07-29-16



CD01779-07-29-16



CD01763-07-29-16

Transport Machine

Towing MegaMc® 824 and 1236 Series 2

The machine towing speed limit is 5 mph.

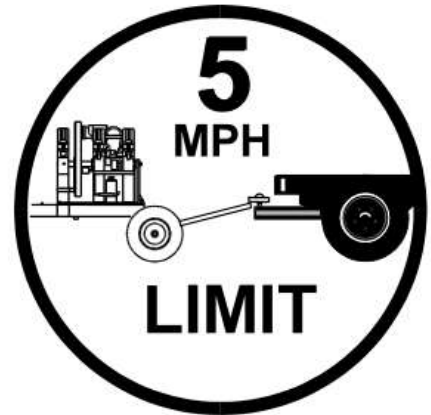
NOTICE: The machine is not designed for high speed towing. Attempting to tow the machine at high speeds can result in machine damage. Always transport the machine by flat bed truck or similar means, and make sure that unit is properly secured.

Ensure the machine outriggers are up completely.

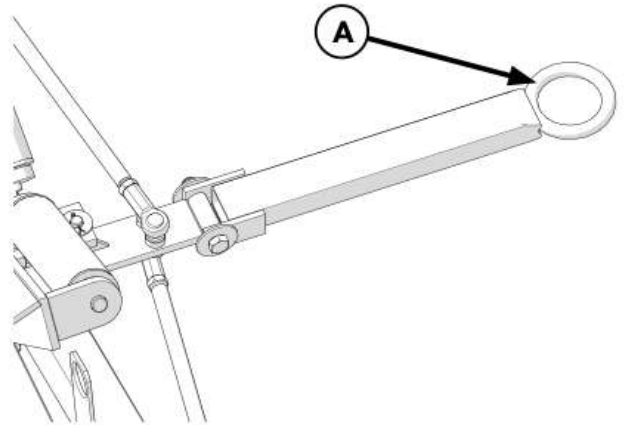
Connect the towing ring (A) to the tow vehicle

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

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



CD00189-1-24-96



CD02085-07-05-17

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

Disconnect Electrical Power



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

TracStar: Actuate the Battery Disconnect switch to remove battery power to the machine.

MegaMc: Unplug the machine power cable to remove electrical power to the machine.

TX04933-03-31-16



WR00055-4-7-93

Washing the Machine

Cover plug 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

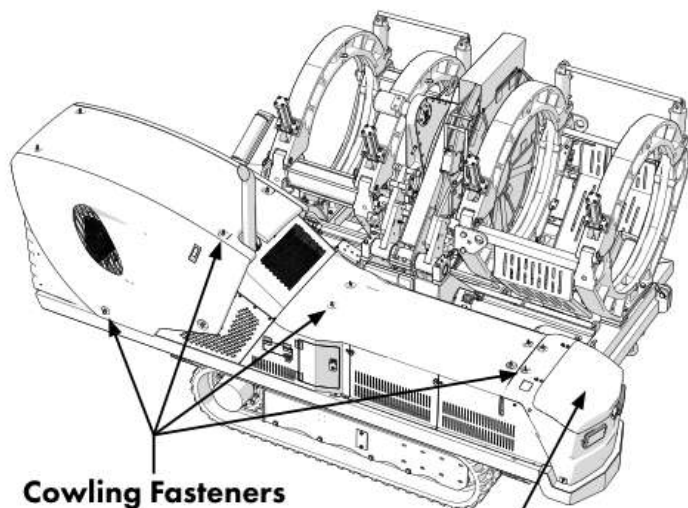
Remove Cowling (TracStar)

The cowlings are attached with quarter turn fasteners.

To remove a cowling, Flip up the ring on the fasteners and quarter turn them to release. Lift and remove the cowling.

To remove the operator console cowling, the lid must be open and the headlights must be unplugged.

Ensure to plug in the headlights when reinstalling the operator console cowling.



Cowling Fasteners

Operator Console Cowling

TX04947-04-18-16

CD01701-06-06-16

Maintenance

Change Hydraulic Fluid and Filter

Ensure the machine is off and disconnected from power source.

The hydraulic fluid and filter should be replaced approximately every 400 hours of operation or if the filter service gauge no longer reads in the green.

Fluid should also be changed as extreme weather conditions dictate.

Disconnect the carriage before draining the unit. Couple the hoses on the vehicle together.

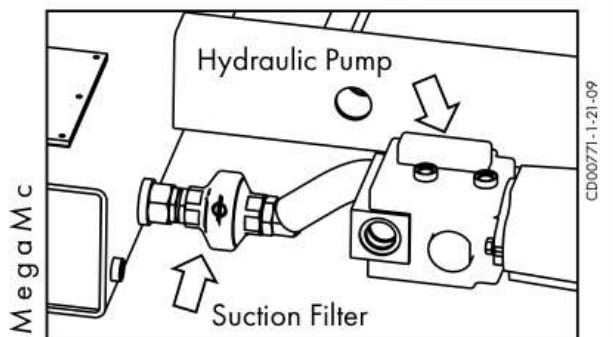
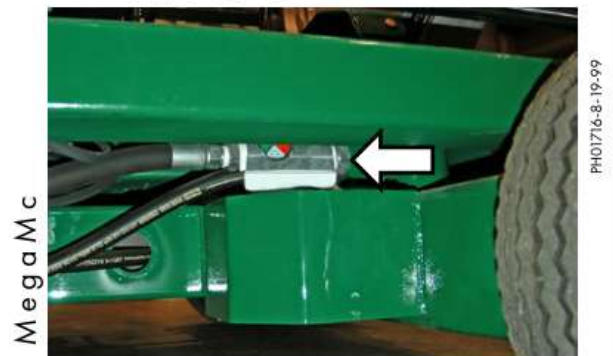
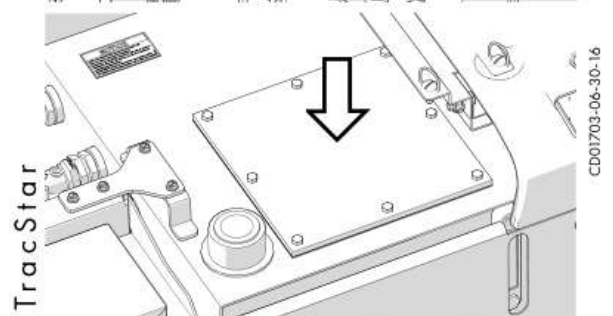
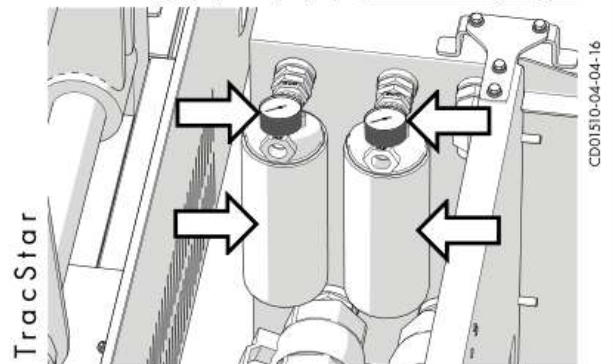
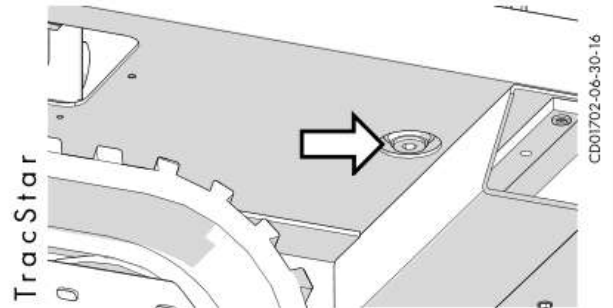
Refer to the "Hydraulic Fluids" section of this manual for hydraulic fluid recommendations.

After the fluid is drained, remove and clean the magnetic suction filters.

TracStar: The suction filter is inside the reservoir and is accessed by removing the access plate on the top of the reservoir. Use compressed air to removed contamination from the magnetic elements.

MegaMc: The suction filter is outside of the reservoir between it and the pump. Use compressed air to removed contamination from the magnetic elements.

After replacing fluid, circulate fluid 5 minutes to remove all air before reconnecting carriage.



Maintenance

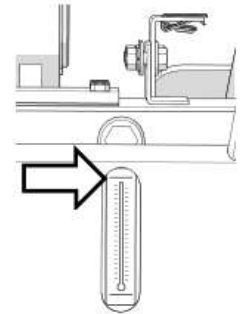
Check Hydraulic Fluid

The hydraulic fluid level should be checked daily.

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

Fill to the high level of the sight gauge when the fluid is cool to allow for fluid volume expansion.

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



CD01505-01-19-16

TX04934-03-31-16

Adjusting System Pressure

TracStar:

Open engine hood to gain access to the hydraulic pump pressure compensator adjustment (A).

Start the engine.

The system pressure is shown on the bottom gauge (B).

CAUTION Do not touch belts and rotating parts while the engine is running. Failure to do so could result in injury.

CAUTION Engine component surfaces can be hot. Use caution when working around hot surfaces.

MegaMc:

The hydraulic pump pressure compensator (C) is attached to the electric motor on the indexer side of the machine near the hydraulic reservoir. The system pressure gauge is located next to the pump (D).

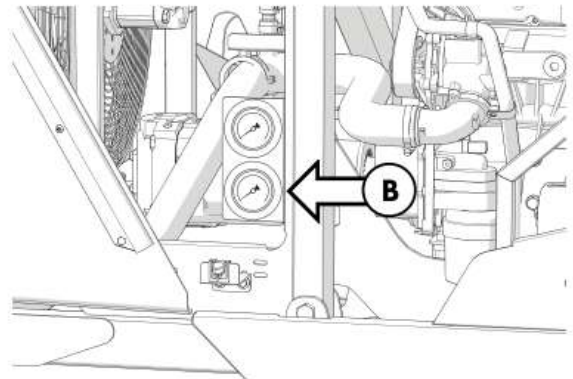
Adjust System Pressure:

To adjust the system pressure, loosen the jam nut and turn the pressure compensator clockwise to increase the pressure, or counter-clockwise to decrease pressure.

The system pressure should be to 2300 psi.

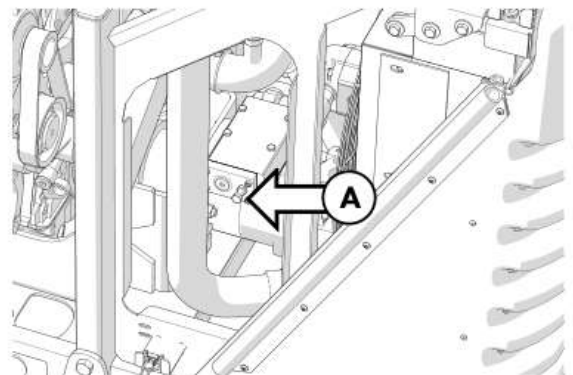
Re-tighten the pressure compensator jam nut.

TracStar



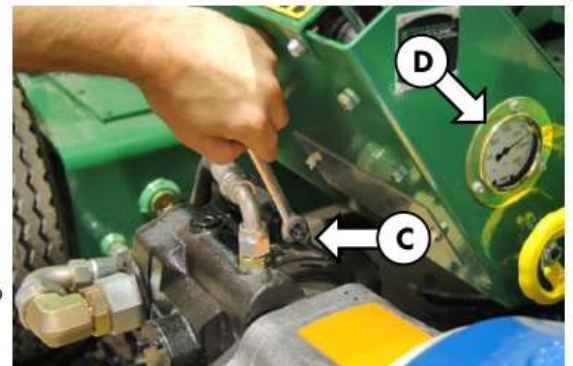
CD01538-03-31-16

TracStar



CD01537-01-28-16

MegaMc



PH03518-10-17-07

TX05096-06-28-16

Maintenance

Bleeding Air From Carriage Cylinders



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.

Tilt machine so the fixed jaw end is higher than the movable jaw end.

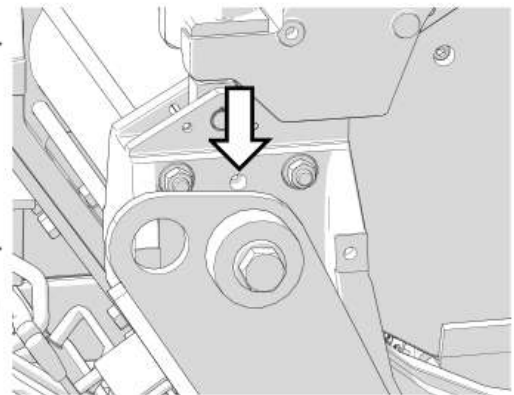
Shift the carriage directional valve to move the carriage to the fixed jaw end and leave valve engaged. Adjust the carriage pressure to approximately 50-100 psi.

Loosen the bleed plug without removing it on one carriage cylinder next to the fixed jaw to allow air to escape. Hold pressure on the cylinder until no air is indicated and quickly retighten the plug.

Repeat bleeding operation on the opposite cylinder next to the fixed jaw.

Tilt the machine so the movable jaw end is higher than the fixed jaw end. Move the carriage to the movable jaw end.

Repeat the bleeding procedures for the carriage cylinders on the movable jaw end.



CD01704-06-30-16

TX04941-04-18-16

Hydraulic Cylinder Cushion

Jaw pivot, heater, and facer hydraulic cylinders are equipped with cushions which slows the motion of the cylinder near the end of the stroke. There is a socket head adjustment screw (A) near either end of the cylinder to adjust these cushions. The rod end adjustment controls cylinder opening cushion. The base end adjustment controls cylinder closing cushion.

Jaw Pivot Cylinders

To adjust the rod end cushion, open the jaws completely. Turn off the machine. The rod end adjustment will be visible through the open jaw. Turn the socket head adjustment screw (A) to make adjustment to cushion. Turning the screw clockwise will increase the cushion and counterclockwise will decrease the cushion.

To access base end cushion adjustment, close jaws and turn off the machine. Remove the 4 bolts that attach the cylinder to the jaw. Lean the cylinder back to reach the socket head adjustment screw (A) and make a fine adjustment. Turning the screw clockwise will increase the cushion and counterclockwise will decrease the cushion. Reattach the cylinder and check the cushion to see if it is correct.

Heater and Facer Pivot Cylinders

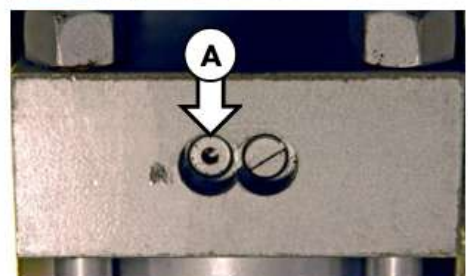
To adjust the rod end and base end cushion, pivot the heater and facer out completely. Turn off the machine. Both adjustments will be accessible. Turn the socket head adjustment screw (A) to make adjustment to cushion. Turning the screw clockwise will increase the cushion and counterclockwise will decrease the cushion.



PH05596-06-28-16



PH05596-06-28-16



PH04925-4-5-13

TX04944-04-18-16

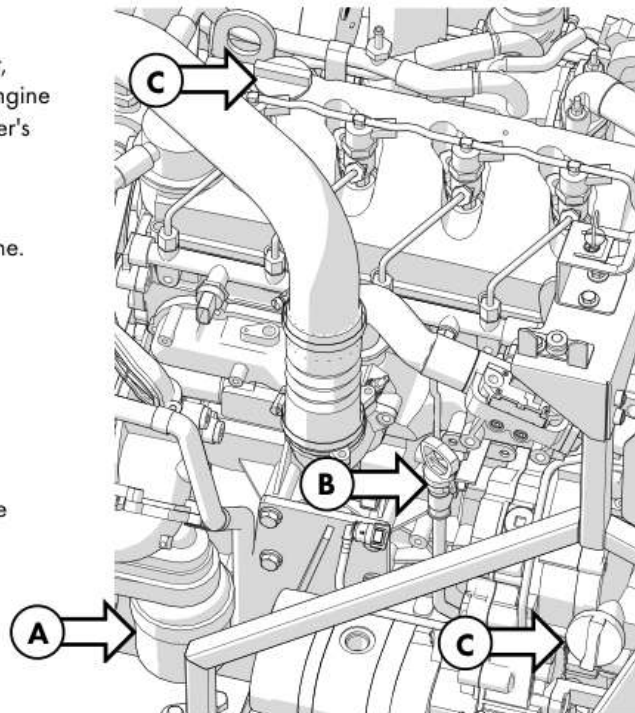
Maintenance

Engine Oil System (TracStar)

Change engine oil after the first 50 hours of operation. Following that, change the oil and filter every 500 hours of operation. Refer to the engine owner's manual for engine maintenance instructions. The engine owner's manual is also available online at quickservice.cummins.com.

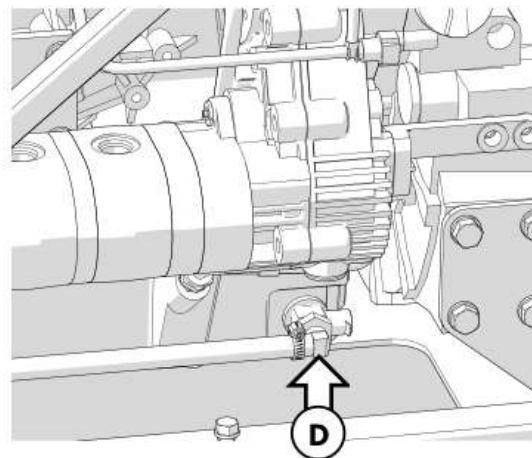
The oil filter (**A**) and oil dipstick (**B**) is located on the side of the engine.

There are 2 oil filler caps (**C**) located on the top and on the side of the engine.



CD01506-01-19-16

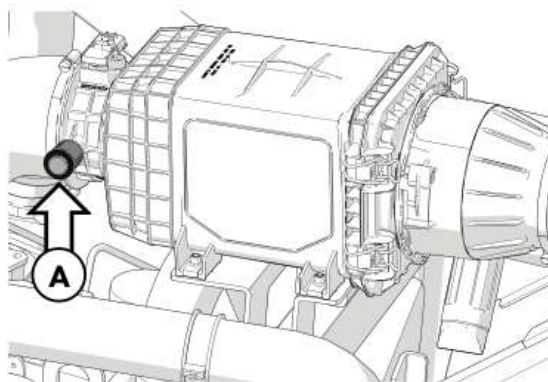
The oil drain valve (**D**) is located on the side of the oil pan.



CD01507-01-19-16

Engine Air Filter (TracStar)

Check the air restriction gauge (**A**). If the gauge is in the red, the air filters need maintenance, refer to the engine owner's manual. The engine owner's manual is also available online at quickservice.cummins.com.



CD01571-02-05-16

TX04937-04-18-16

Maintenance

Prime Fuel System (TracStar)

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

Unlock the manual priming pump handle by turning counterclockwise. Pump the handle until resistance is felt and the handle can not be pumped any longer (approximately 140 to 150 strokes for dry filters, or 20 to 60 strokes for pre-filled filters).

Lock the manual priming pump handle by pushing in completely and turning clockwise.

Start the engine. If the engine does not start after 30 seconds, turn the key switch to the OFF position.

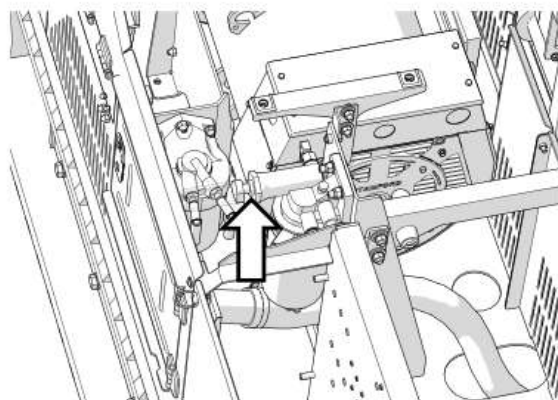
Pump the priming pump again, repeating the previous steps until the engine starts.

When the engine does start, it may run erratically and with increased noise levels for a few minutes. This is a normal condition.

If the engine does not start, contact the engine manufacturer's authorized repair location.

Operate the engine and check for fuel leaks.

TX04938-04-18-16



CD01508-01-19-16

Replace Fuel Filter (TracStar)

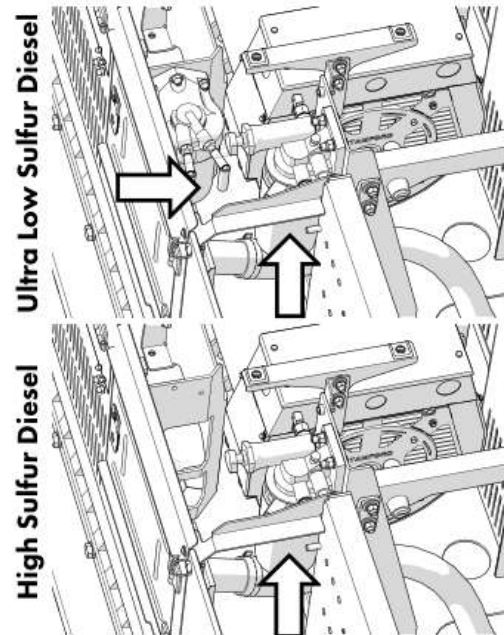
Engines (Ultra Low Sulfur Diesel Only):

Replace fuel filters, both engine and prefilter/water separator, according to the interval in the engine owner's manual (500 hours or 6 months). The engine owner's manual is also available online at quickserve.cummins.com.

Engines (High Sulfur Diesel):

Replace engine fuel filter, according to the interval in the engine owner's manual (500 hours or 6 months). The engine owner's manual is also available online at quickserve.cummins.com.

TX04961-04-20-17



CD01508-01-19-16

CD02026-04-20-17

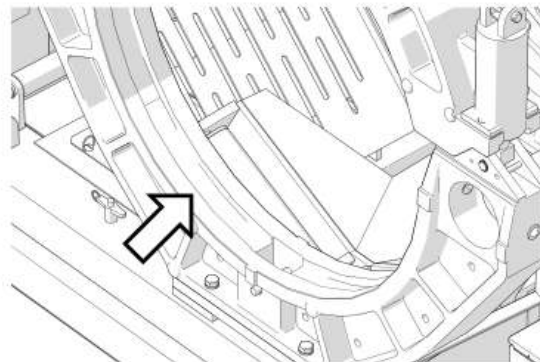
Clean Jaws and Inserts

Ensure the machine is off and disconnected from power source.

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

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

TX00433-04-18-16



CD01703-06-06-16

Maintenance

If Unit Fails to Start (MegaMc)

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

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

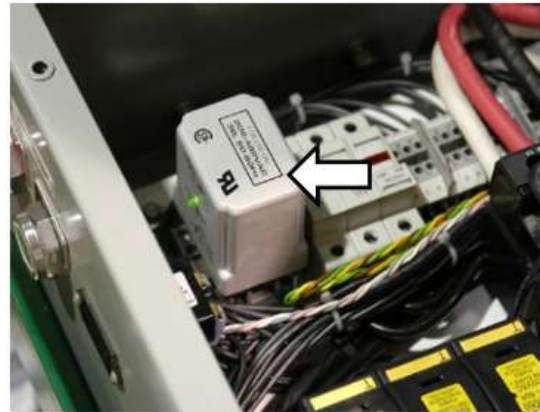


Do not touch electrical components with the machine connected to power. A possible shock hazard could occur leading to serious injury or death.

If unit fails to start, open the main power box and observe if the light on the reverse phase relay is on. If not, disconnect the power source and have qualified service personnel switch any two incoming power leads and try again. If the unit still doesn't start, have the qualified service personnel troubleshoot further.

Inspect fuses inside main power box. Replace as required.

TX00810-04-18-16



PH03495-10-17-07

Facer Blades

Ensure the machine is off.

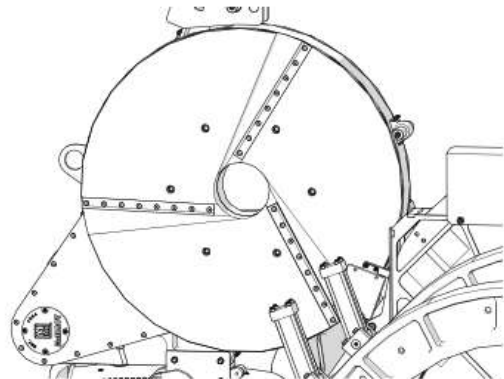


Facer blades are sharp and can cut. Never attempt to remove shavings while the facer is running, or is in the facing position between the jaws. Use care when operating the facer, and when handling the unit.

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

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

TX04939-04-18-16



CD01643-05-19-16

Installing Butt Fusion Heater Plates

Install butt fusion heater plates while the heater is cool.



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.

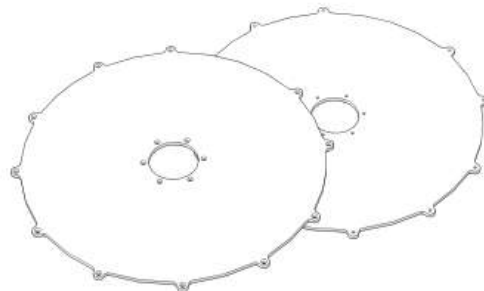
Butt fusion heater plates are installed with stainless steel cap screws. Always use high temperature anti-seize compound on mounting screw threads for easier removal later.

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

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

IMPORTANT: Do not over tighten the bolts.

TX02716-04-18-16



CD1706-06-06-16

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.

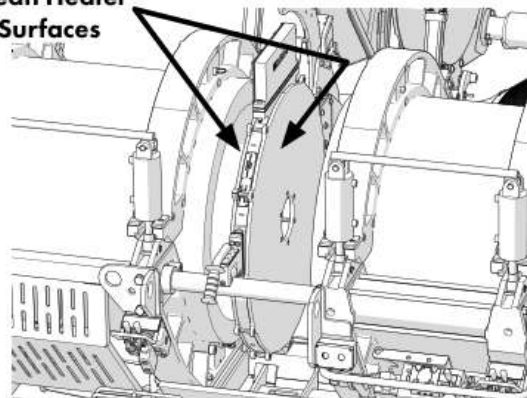
The surface of the butt fusion heater plates are coated with an anti-stick coating.

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

Clean Heater Surfaces



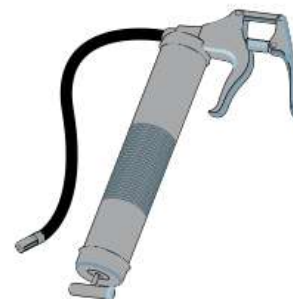
CD01767-07-29-16

Grease

Keep moving parts well lubricated daily with a high quality grease, such as Mobil® XHP 462 grease.

- Jaw pivot pins
- Facer pivot bushings
- Heater pivot bushings
- Hydraulic cylinder pivot pins
- Facer

TX05098-06-28-16



CD00183-11-6-95

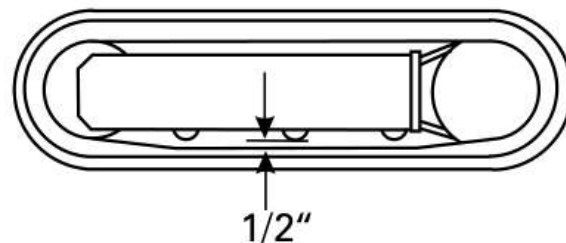
Track Tension (TracStar)

Park the machine on a flat solid surface.

Use the lifting device to raise machine off the ground.

Place adequate supports under the bottom frame after lifting.

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



CD00463-2-25-98

TX05097-06-28-16

Maintenance

Adjusting Track Tension (TracStar)

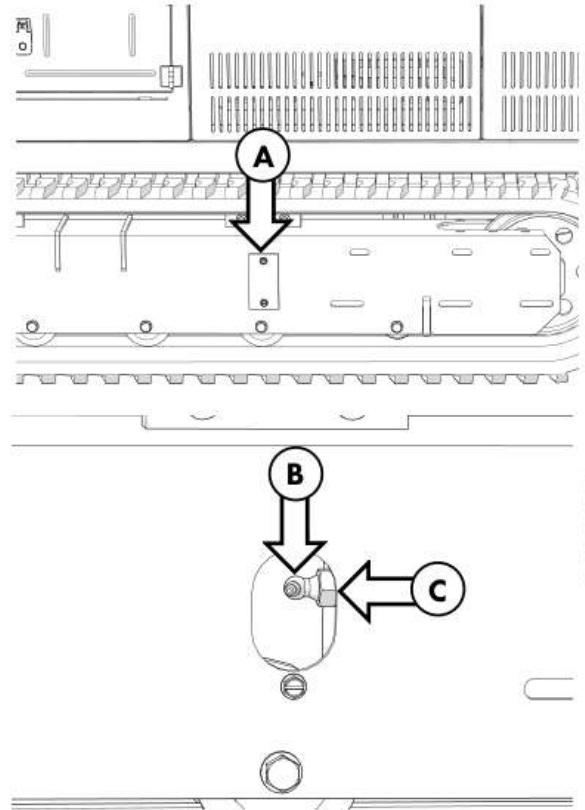
CAUTION The grease in the track tension cylinder is pressurized. If the grease valve is loosened too far, the valve and grease can be expelled at high pressure and cause injury. Injury could also result if the grease zerk is loosened. Never loosen the grease zerk.

Remove screws and cover (A) to access the track tension grease valve and zerk.

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

To reduce track tension or to loosen and remove track, relieve pressure in the track tension cylinder by turning the hex shaped valve (C) counterclockwise until grease begins to come out. When correct track tension is obtained, turn valve clockwise and tighten it. Clean off any expelled grease.

Replace access cover and tighten down screws.



CD01513-01-19-16

CD01514-01-19-16

TX02632-04-18-16

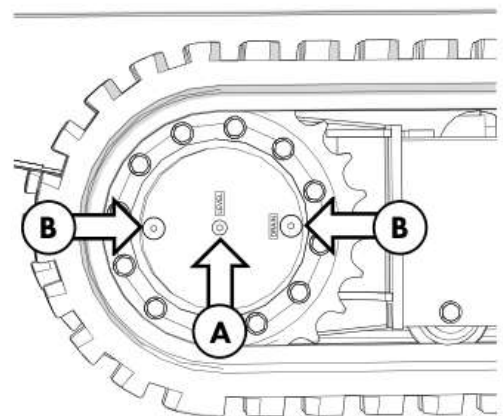
Checking Track Gearbox Oil (TracStar)

Check the oil level in both track gearboxes periodically.

To check the oil level, Remove the center level plug (A) and check that the oil level is up to the plug hole. If oil needs to be added, fill through one of the holes (B) that is above the center plug until the oil level reaches the center plug hole.

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

Replace the plugs and tighten.



CD01519-01-25-16

TX04945-04-18-16

Maintenance

Changing Track Gearbox Oil (TracStar)

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.

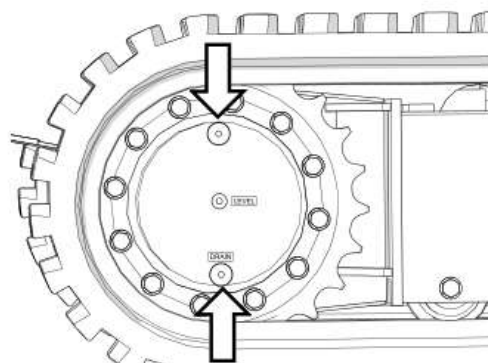
To replace the oil, stop the gearbox with the fill/drain aligned vertically.

Remove all three plugs and drain out all oil. Once the oil is drained, replace the bottom drain plug.

Fill the gearbox through the top plug until the oil level is to the center plug.

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

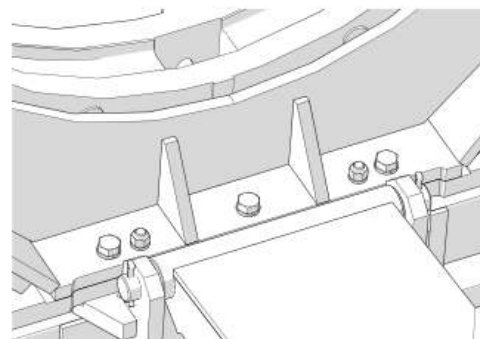
Replace the plugs and tighten.



TX04946-04-18-16

Fasteners Must Be Tight

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

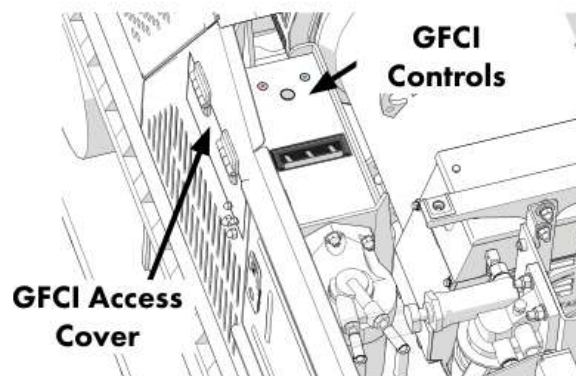


TX00437-9-13-94

Ground Fault Circuit Interrupter (GFCI) Testing

OPERATION AND TEST INSTRUCTIONS

1. Apply power to the unit.
2. Assure that the circuit breaker is in the **ON** position.
3. The green **POWER** indicator will be illuminated.
4. Power is available at the output.
5. Press the **TEST** button.
6. The circuit breaker will trip to the **OFF** position.
7. The red **FAULT** indicator will be illuminated.
8. **RESET** the circuit breaker by returning it to the **ON** position.
9. The **FAULT** indicator light will darken and the **POWER** indicator will be illuminated.
10. Testing is complete and the equipment is now ready for operation.



Do not use this device if it fails any portion of the above test. Consult a qualified electrician for repair or replacement.

TX05405-06-12-19

Maintenance

Radio Remote Batteries (TracStar)

To replace the battery in the remote:

Rotate the remote to the bottom.

Push the battery away from the tabs holding the battery and lift the battery out of the remote.

Use the battery charger to recharge the battery.

Replace with a fully charged battery.

There is also a battery pack which uses standard batteries. Place the 3 AA batteries into the battery pack and insert the battery pack into the remote.



PH05456-01-25-16

PH05474-03-31-16

PH05473-03-31-16

TX04949-04-18-16

Battery Replacement and Charging (TracStar)

Remove the operator console cowl.

The battery for the vehicle is under the operator console of the machine.

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

To remove the battery, remove the two bolts (A) and slide the battery tray out. Remove the battery holder.

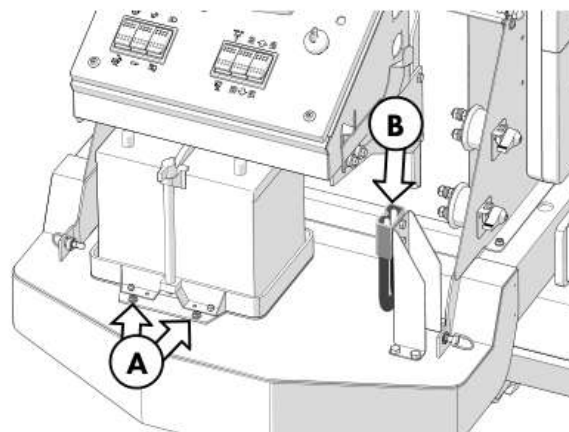
Replace the battery with one that meets all of the requirements listed below.

- Minimum capacity-cold soak at 0 F° (-18 C°) or above
- Engine only-cold cranking amperes: 850 (CCA)
- Engine only-reserve capacity: 135 min (RC)

Battery Charging Connection

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

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



CD01711-06-28-16

TX04948-04-13-17

Maintenance

Heater Element Failure Detection (HEFD)

The Heater Element Failure Detector's (HEFD) primary function is to detect one or more failed heater elements and subsequently alert the operator. The HEFD detects failed elements by measuring each of the three line currents and comparing them to programmed, or "taught", low-current and high-current thresholds. If out of programmed range for more than 30 seconds, an alarm is activated.

INPUTS

Reset Button – Used to reset the HEFD if it is signaling an alarm. Voltage, Wrong Heater, and Element Failure Errors may be reset by depressing the Reset button. However, if the condition that triggered the error initially persists, the HEFD will signal the alarm again.

Test Button – Used to test the element burn-out functionality. Press and hold the Test Button continuously for at least 30 seconds while the heater is on. The HEFD should signal an Element Failure Error. Press the reset button to clear the error.

Teach Button – Used to program, or "teach", new line-current thresholds.

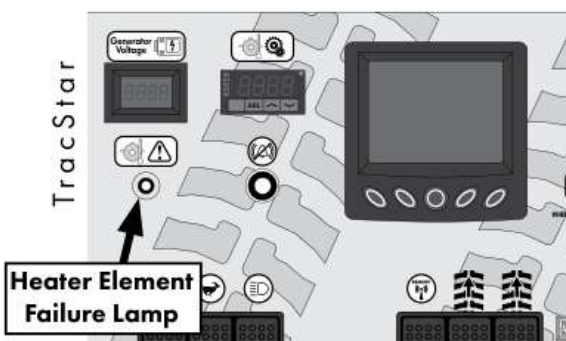
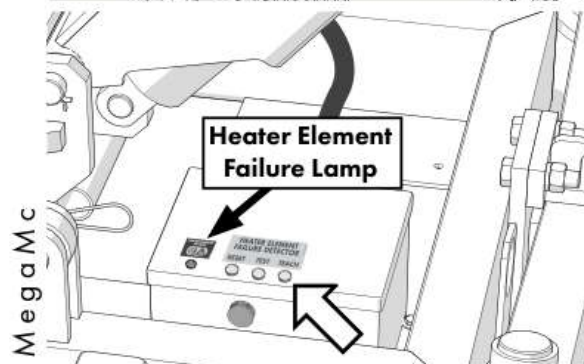
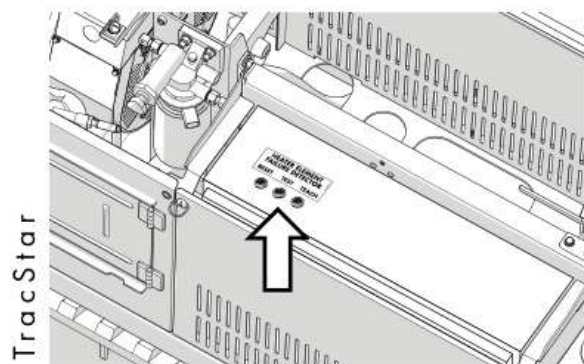
OUTPUTS

Heater Element Failure Lamp – Signals an error condition to the operator by flashing various error codes.



Teach Button Lamp – Signals the success or failure of a programming, or "teaching" operation. It is generally located in close proximity to, or is a part of, the teach button.

Audible Alarm – Signals a heater related error condition. On machines with automated or automatic control systems, this audible alarm also signals the machine operator of certain normal fusion operation conditions (not necessarily errors).



CD01557-04-04-16

CD02082-06-30-17

8163300
CD01558-04-04-16

CD01465-08-01-16

Maintenance

Heater Element Failure Detection (HEFD) (continued)

TEACHING THE HEFD

Due to manufacturing variances in the resistance of each heating element, the HEFD must be taught, or programmed, for each individual heater. This teaching, is accomplished by continuously depressing the Teach button for 3 seconds while the heater is on. If teaching is successful, the Teach Button Lamp will flash slowly 2 times at the end of the 3-second teaching period. If an error is detected during the "teaching" process, the Teach Button Lamp will flash rapidly as soon as the Teach Button is depressed. Possible error sources are:

- 1) The heater is off.
- 2) One of the current transducers is malfunctioning or has become disconnected from the HEFD Programmable Logic Controller (PLC).

ERROR CODES

If an error is present the audible alarm will sound and the Heater Element Failure Lamp will flash a pattern corresponding to the particular error that has been detected. The Heater Element Failure Lamp patterns are shown below. Voltage, Wrong Heater, and Element Failure Errors may be reset by depressing the Reset button. However, if the condition that triggered the error initially persists, the HEFD will signal the alarm again.

Automated and automatic machines notify the operator of errors via the machine's Fusion Control System in addition to displaying Error Codes and controlling the audible alarm.

Error Code Pattern Chart

Voltage Error	■						
Teach Mode	■		■				
High Current Failure	■		■		■		
Low Current Failure	■		■		■		■
HEFD Error	■	■	■	■	■	■	■
Seconds	1	2	3	4			

■ Indicates Error Light is Lit

Voltage Error

This pattern is displayed when the machine's supply voltage is outside the $\pm 15\%$ of the nominal supply voltage range. Ensure that the machine's supply voltage is within the machine's nominal voltage range. TracStar machines are less likely to experience supply voltage variations and as a result, do not measure the supply voltage or signal Voltage Errors.

For example, a MegaMc® 1648 Series 2's nominal supply voltage range is 220VAC to 240VAC. If the supply voltage is less than 187VAC (220VAC - 15%) or greater than 276VAC (240VAC + 15%), a Voltage Error will be signaled.

Teach Mode

This pattern is displayed when the line-current thresholds have not been taught. This is most commonly encountered when the HEFD is initially installed on the machine or after the HEFD PLC has been replaced during a service operation. Teach the HEFD new line-current thresholds.

Heater Element Failure Detection (HEFD) (continued)

High Current Failure

This pattern is displayed when the heater's line currents are above the high-current threshold for more than 30 seconds. This error is generally signaled when change of heaters, from a smaller to larger heater, occurs. If this error is signaled and the heater is of the correct size, re-teach the line-current thresholds.

Low Current Failure

This pattern is displayed when the heater's line currents are below the low-current threshold for more than 30 seconds. This error is generally signaled when an element in the heater has burned-out, or failed or installing a smaller heater that hasn't been taught. If this error is signaled, check the heater's surface temperature for cold spots.

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

A failed element will result in a ring of cold zones corresponding to the location of the failed element. It is imperative that the heater is fixed before operation. If this error is signaled and the heater is found to be functioning correctly, it is likely that the heater has been changed and new line-current thresholds were not taught. In this case, re-teach the HEFD.

HEFD Error

The HEFD Error is signaled when the HEFD is not powered or the HEFD PLC program is not running. It is normal for this error to be displayed momentarily while the machine is starting up. A constant display of this error generally indicates a faulty HEFD PLC power-supply fuse, a wiring problem, or a PLC hardware problem.

Maintenance

Engine Monitoring System (TracStar)

The Engine Monitoring System is a device on the operator console that is connected to the Engine Control Module ECM and monitors the engine systems.

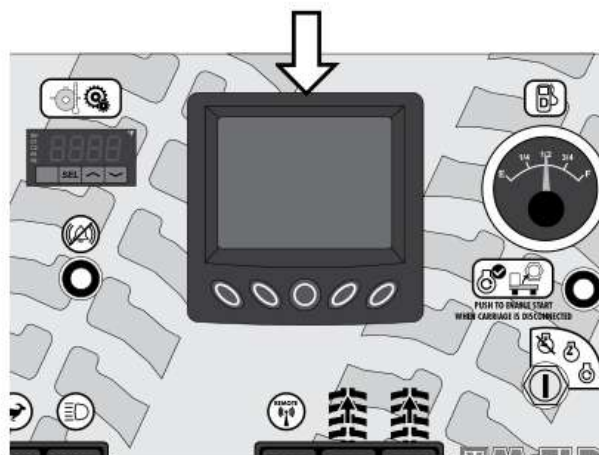
During the start up screen, the engine preheating symbol may be present when the engine intake is preheating (A).

Wait until the screen changes to the engine gauges screen before starting the engine (B).

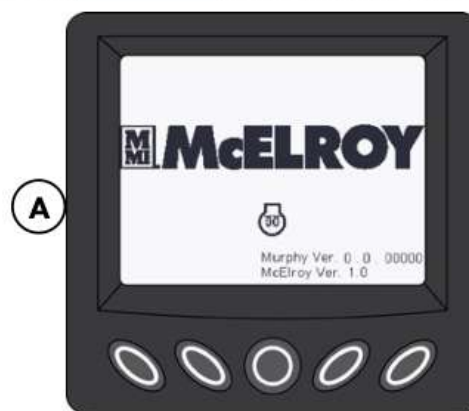
NOTICE: Starting the engine before the preheating is complete could damage the engine. Allow the engine to complete the preheat cycle before starting the engine.

There are 5 soft keys below the screen for operator input. There is an amber warning LED between the two left keys and a red shutdown LED between the two right keys to alert the operator.

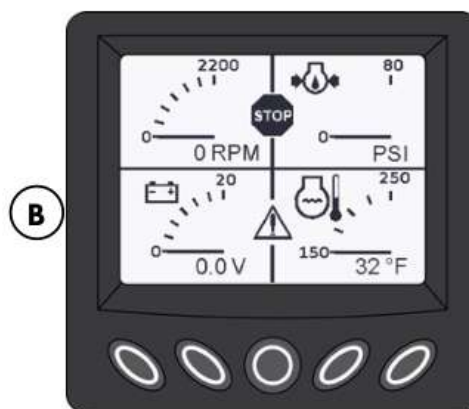
There are 2 Engine Gauge pages that can be accessed by pressing any of the soft keys. Switch between the pages by pressing the right soft key. ➡



CO01465-08-01-16



PH05458-02-03-16



PH05462-02-03-16



PH05461-02-03-16

➡ ENGINE GAUGES Page 1

- Engine RPM
- Engine Oil Pressure
- Battery Voltage
- Engine Coolant Temperature

STOP Engine Shutdown - Alerts the operator of a condition that requires an engine shutdown.

⚠ Active Fault Alert - Alerts the operator of an active fault recorded by the ECM.

➡ ENGINE GAUGES Page 2

- Hydraulic Fluid Temperature
- Engine Hours
- Engine Load

STOP Engine Shutdown - Alerts the operator of a condition that requires an engine shutdown.

⚠ Active Fault Alert - Alerts the operator of an active fault recorded by the ECM.

Maintenance

Engine Monitoring System (continued)



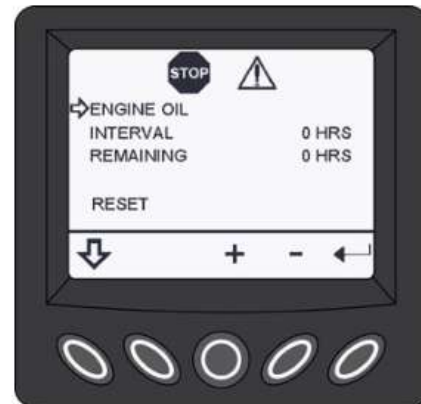
SERVICE REMINDER MENU

Access by pressing second from right soft key.

Displays maintenance reminders for:

- Engine oil
- Fuel Filter
- Engine air filter
- Hydraulic oil
- Service engine
- Service machine

The interval for maintenance can be set and the hours of operation remaining is displayed.



PH05460-02-03-16



DIAGNOSTICS MENU

Access by pressing middle soft key.

- View the active faults recorded by the ECM.
- View the stored faults recorded by the ECM.
- Clear the fault codes.



PH05463-02-03-16

DIAGNOSTIC MESSAGE

Accessed from the Diagnostic Menu screen or when the fault is triggered.

SPN: Suspect Parameter Number

FMI: Failure Mode Indicator

OC: Number of Occurrences

Text String: Description of the error.

Device ID: Displays device ID

Address: Displays device address number

Errors can be referenced for more information by going online to quickserve.cummins.com and entering the SPN and FMI.



PH05464-02-03-16



SETTINGS MENU

Access by pressing far left soft key.

Change how the Engine Monitoring System displays.

- Brightness
- Contrast
- Units of Displayed Values
- Language of Text
- ECM Address



PH05459-02-03-16

Maintenance

Heater Temperature Adjustment

The thermometer on the heater will not read actual surface temperature and should be used only as a general indicator.

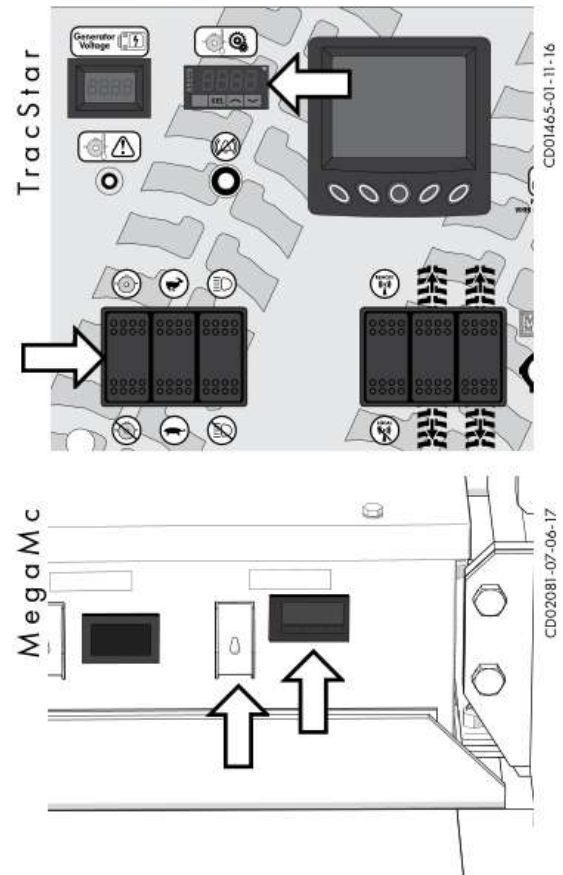
TracStar:

The heater switch and temperature controller are located on the operator console.

MegaMc:

The heater switch and temperature controller are located on the front of the control panel box.

Heater surface temperature should be checked periodically with a pyrometer and the necessary adjustment made to the temperature controller.



TX05314-07-11-17

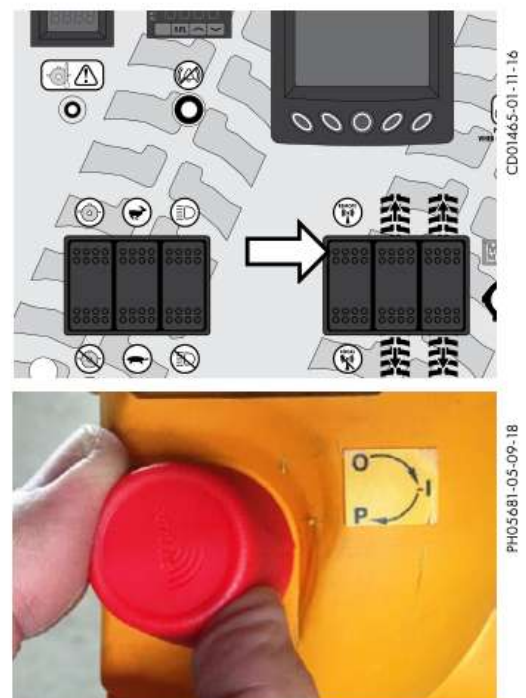
Adjust Remote Driving Track Speeds (TracStar)

This procedure is used adjust the individual track speeds in Fast, Slow and Crawl Modes.

Start machine and switch to Remote.

Pull black key out of transmitter and install red programming key.

Turn key clockwise to "On" position (I)



Maintenance

Adjust Remote Driving Track Speeds (TracStar) (continued)

Put Run/Standby switch in Run position.



PH05692-05-09-18

Push green Connect button on right side of transmitter.



PH05683-05-09-18

To adjust crawl mode set switch to Crawl On.

To adjust other speeds set Crawl Off.

Drive the machine forward.

If one track does not move, follow directions to speed up that track. If both tracks move, but one track is faster. Slow down the faster track.



PH05693-05-09-18

Shut off engine from the transmitter.



PH05684-05-09-18

Rotate red key clockwise to P (program).



PH05685-05-09-18

Select joystick of the track that needs adjustment. Hold joystick in the direction to be changed.



PH05686-05-09-18

Maintenance

Adjust Remote Driving Track Speeds (TracStar) (continued)

Decrease track speed by tapping Engine Shut Off button on left side of radio.

NOTE: With Crawl mode on, one or two taps make a noticeable change. With Crawl off, 20 or more taps may be required.



PH05688-05-09-18

Increase track speed by tapping the Engine Start button on the left side of the radio.

Release joystick.



PH05689-05-09-18

Rotate red key to "On" position (I).



PH05681-05-09-18

Repeat procedure until machine tracks acceptably straight.

NOTE: Tracking may vary with hydraulic fluid temperature.

Drive machine in reverse. Repeat procedure to adjust track speeds for straight tracking in reverse.

Remove red programming key from transmitter and re-install black key.



PH05694-05-09-18

TX05337-05-29-18

Maintenance

Fuji Model PXR3 Temperature Controller Setup

Setting the heater temperature

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

Checking the heater with a pyrometer

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

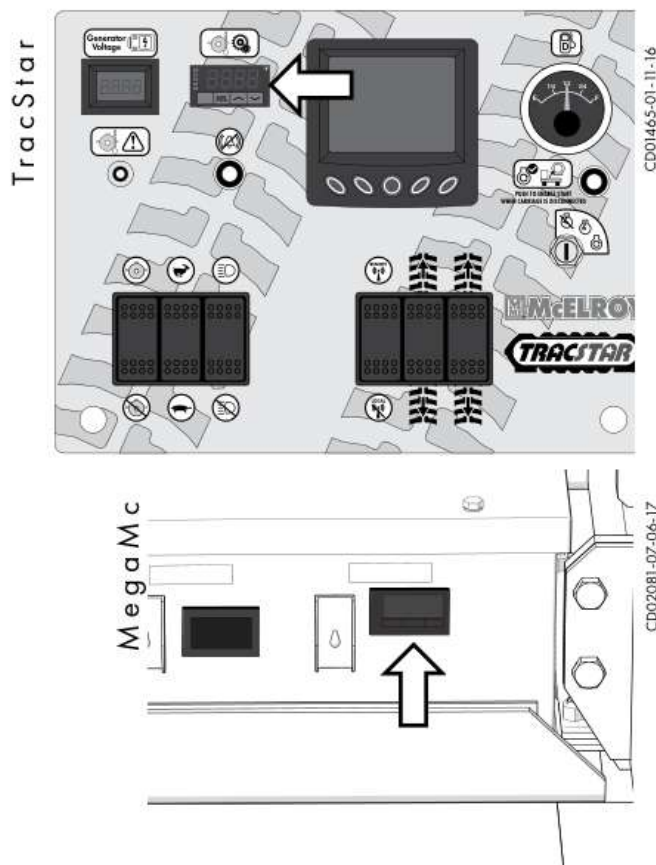
Adjusting the Controller Bias Setting

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

Perform Auto-Tune

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

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



Inspection Checklist

TracStar® 630 and 900 Series 2

		OK
1.	For engine maintenance & service, Review engine manual	
2.	Machine is clean	
3.	Inserts and inserts detent pins are installed	
4.	All fasteners (nuts, bolts, pins, etc) are in place and properly tightened	
5.	All identification placards are on unit	
6.	Wiring, battery cables, & all electrical terminals are in good condition	
7.	Tracks are in good repair and tensioned properly	
8.	Hydraulic fluid is visible in reservoir sight glass	
9.	No visual fluid or water leaks (engine and hydraulic system)	
10.	Fuel tank is full (ultra low sulfur diesel only)	
11.	Engine oil level is correct	
12.	Cooling system level is correct	
13.	Hydraulic hoses are in good condition	
14.	Engine starts and runs properly	
15.	Facer works properly	
16.	Heater in good condition (no nicks or gouges in butt plates)	
17.	Correct surface temperature verified with a pyrometer	
18.	Switches and buttons operate properly	
19.	Two position throttle control works properly	
20.	Engine Monitoring System works properly	
21.	System pressure set to 2300 psi	
22.	Carriage works smoothly	
23.	Remote functions properly and batteries are sufficiently charged	
24.	Hydraulic valves function properly	
25.	No damage to fusion machine	
26.	All hydraulic cylinders are adjusted (cushion, speed, and travel)	
27.	HEFD functions properly	
28.	Vehicle cowlings attached properly	
29.	All grease points and pivot points lubricated	
30.	All facer rest buttons are in place	
31.	Lifting device and slings are in good condition	
32.	Facer blades in good condition (all present, not dull or chipped, etc.)	

Inspection Checklist

MegaMc® 824 and 1236 Series 2

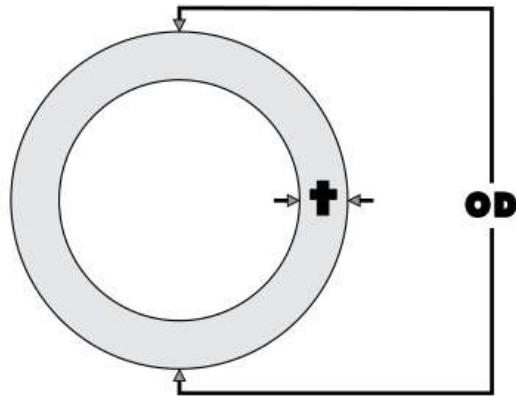
		OK
1.	Machine is clean	
2.	Hydraulic fluid is visible in reservoir sight glass	
3.	Hydraulic hoses are in good condition	
4.	Carriage works smoothly	
5.	All hydraulic cylinders adjusted (cushion, speed and travel)	
6.	All grease points and pivot points lubricated	
7.	No visual fluid leaks (hydraulic system)	
8.	All identification placards are on unit	
9.	Wiring & all electrical terminals are in good condition	
10.	Electric motor starts and runs properly	
11.	Inserts and insert detent pins are installed	
12.	Facer works properly	
13.	Heater in good condition (no nicks or gouges in butt plates)	
14.	Correct surface temperature verified with a pyrometer, compare to temperature controller setting	
15.	Switches and buttons operate properly	
16.	All fasteners (nuts, bolts, pins, etc.) are in place and properly tightened	
17.	System pressure is set to 2300 psi	
18.	Tire pressure correct and tires in good condition	
19.	Power cords and plugs in good condition	
20.	All facer rest buttons in place	
21.	Tow bar is in good condition	
22.	Outriggers function properly	
23.	Hydraulic valves operate properly	
24.	No damage to fusion machine	
25.	HEFD functions properly	
26.	Lifting device and cables in good condition	
27.	Facers blades in good condition (all present, not dull or chipped, etc.)	

TX05315-07-11-17

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)



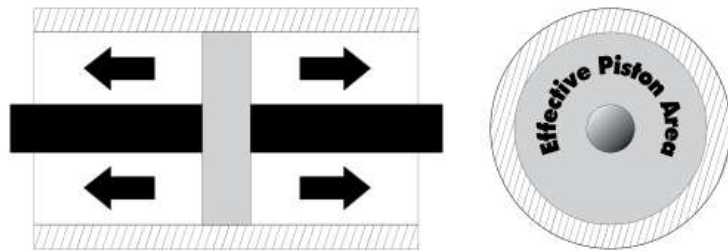
Formulas

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

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

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

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



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/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.

TX03082-04-18-16

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

TracStar® 630 Series 2 Specifications

Weights (with fluids full)

Total Machine Weight: 9,075 lbs (4,116 Kg)

Vehicle Only Weight: 5,190 lbs (2,354 Kg)

Carriage, 4 Jaws: 3,885 lbs (1,762 Kg)

Carriage, 3 Jaws: 1,412 lbs (640 Kg)

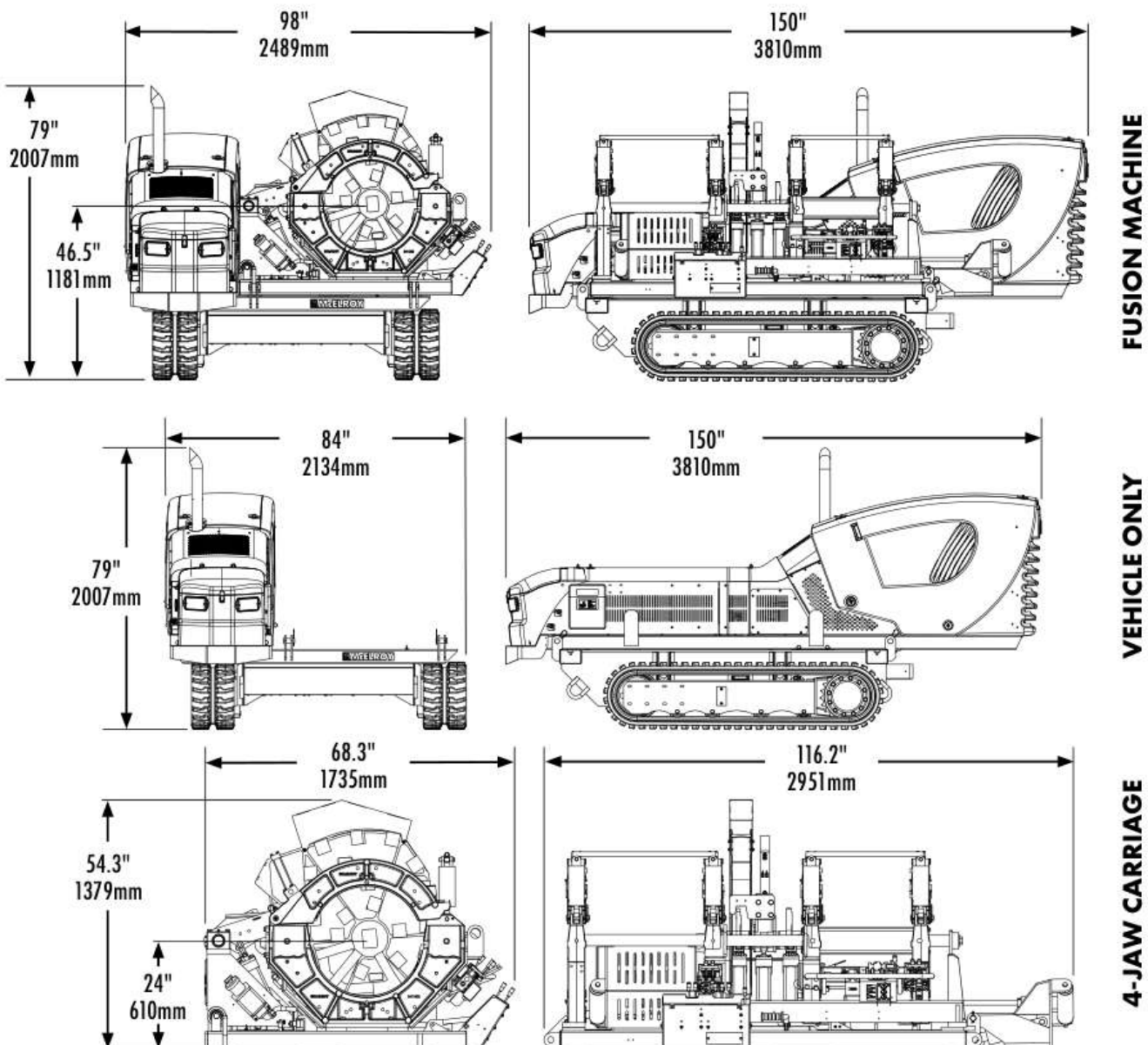
Outer Fixed Jaw: 185 lbs (84 Kg)

Facer: 390 lbs (177 Kg)

Heater: 240 lbs (109 Kg)

Lifting Device (Spreader Bar): 175 lbs (79 Kg)

Dimensions





Specifications

TracStar® 630 Series 2 Specifications (continued)

Carriage

Maximum Pipe Diameter: 24" OD (630mm)

Minimum Pipe Diameter: 8" IPS (225mm)

Low Force Total Effective Piston Area (TEPA): 9.43 sq in (60.6 sq cm)

Maximum Force: 21,689 lbs (9,838 kg)

Medium Force Total Effective Piston Area (TEPA): 15.32 sq in (98.8 sq cm)

Maximum Force: 35,236 lbs (15,983 kg)

High Force Total Effective Piston Area (TEPA): 29.44 sq in (189.9 sq cm)

Maximum Force: 67,712 lbs (30,714 kg)

Engine

Tier 4 / Stage 3b – Engine Model Number QSF2.8t4TC74 (Ref No. MDA00241)

74HP (55Kw), 2.8L, 4 Cylinder Turbo, Charge Air Cooled, EGR, US EPA Tier 4f, EU Stage IIIB, DEF not required

Fuel Type: Ultra Low Sulfur Diesel (15PPM)

Stage 3a – Engine Model Number QSF2.8t3TC72 (Ref No. MDA00293)

72HP (54Kw), 2.8L, 4 Cylinder Turbo, EU Stage IIIA, DEF not required

Fuel Type: High Sulfur Diesel

Fuel Tank Capacity: 23 gal (87 liters)

Operational Tank Capacity: 12 Hours approximately

Hydraulics

Reservoir Capacity: 23 gal (87 liters)

Operating System pressure: 2,300 PSI (157 bar)

Maximum carriage fusing pressure: 2,300 PSI (157 bar)

Heater

Power: 10,950 Watt

Mobility

Self-propelled vehicle with rubber crawler tracks

Vehicle speed: Low 1.0 mph/High 1.5 mph

Specifications

TracStar® 900 Series 2 Specifications

Weights (with fluids full)

Total Machine Weight: 9,960 lbs (4,518 Kg)

Vehicle Only Weight: 5,190 lbs (2,354 Kg)

Carriage, 4 Jaws: 4,770 lbs (2,164 Kg)

Carriage, 3 Jaws: 1,745 lbs (792 Kg)

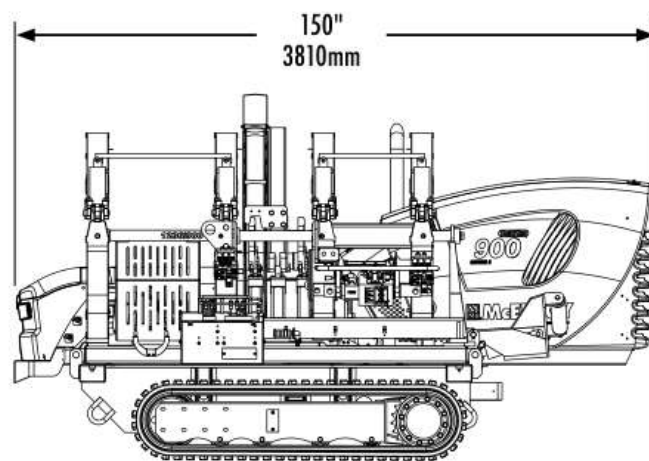
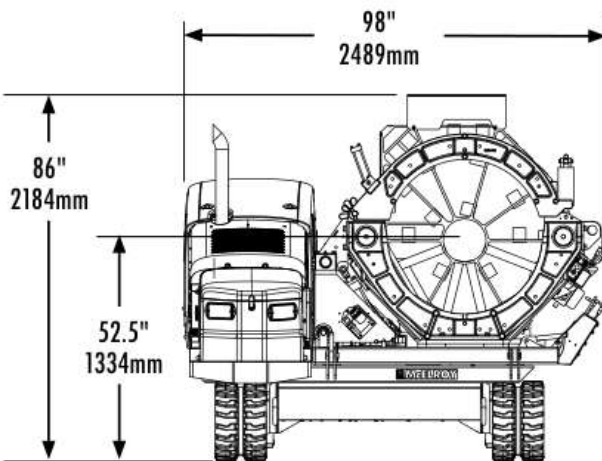
Outer Fixed Jaw: 337 lbs (153 Kg)

Facer: 480 lbs (218 Kg)

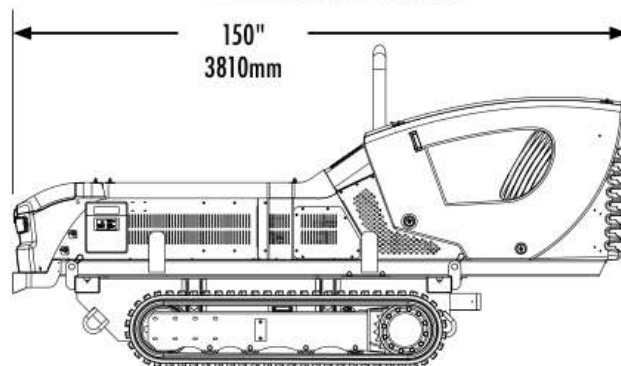
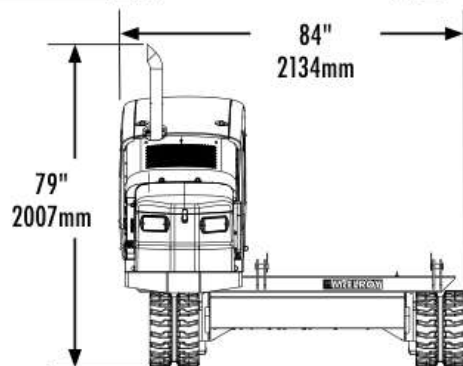
Heater: 382 lbs (173 Kg)

Lifting Device (Spreader Bar): 175 lbs (79 Kg)

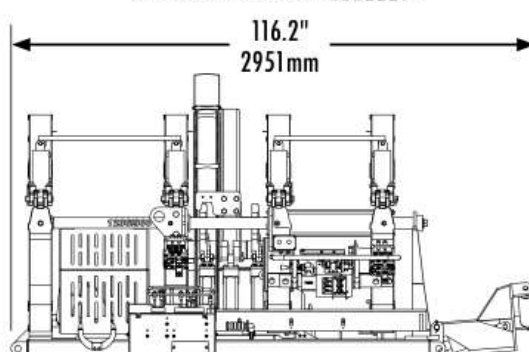
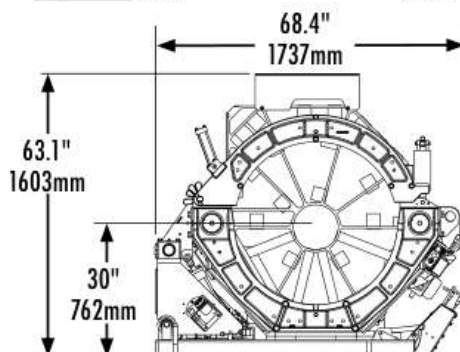
Dimensions



FUSION MACHINE



VEHICLE ONLY



4-JAW CARRIAGE



Specifications

TracStar® 900 Series 2 Specifications (continued)

Carriage

Maximum Pipe Diameter: 36" OD (900mm)

Minimum Pipe Diameter: 12" IPS (340mm)

Low Force Total Effective Piston Area (TEPA): 9.43 sq in (60.6 sq cm)

Maximum Force: 21,689 lbs (9,838 kg)

Medium Force Total Effective Piston Area (TEPA): 15.32 sq in (98.8 sq cm)

Maximum Force: 35,236 lbs (15,983 kg)

High Force Total Effective Piston Area (TEPA): 29.44 sq in (189.9 sq cm)

Maximum Force: 67,712 lbs (30,714 kg)

Engine

Tier 4 / Stage 3b – Engine Model Number QSF2.8t4TC74 (Ref No. MDA00241)

74HP (55Kw), 2.8L, 4 Cylinder Turbo, Charge Air Cooled, EGR, US EPA Tier 4f, EU Stage IIIB, DEF not required

Fuel Type: Ultra Low Sulfur Diesel (15PPM)

Stage 3a – Engine Model Number QSF2.8t3TC72 (Ref No. MDA00293)

72HP (54Kw), 2.8L, 4 Cylinder Turbo, EU Stage IIIA, DEF not required

Fuel Type: High Sulfur Diesel

Fuel Tank Capacity: 23 gal (87 liters)

Operational Tank Capacity: 12 Hours approximately

Hydraulics

Reservoir Capacity: 23 gal (87 liters)

Operating System pressure: 2,300 PSI (157 bar)

Maximum carriage fusing pressure: 2,300 PSI (157 bar)

Heater

Power: 20,461 Watt

Mobility

Self-propelled vehicle with rubber crawler tracks

Vehicle speed: Low 1.0 mph/High 1.5 mph

Specifications

MegaMc® 824 Series 2 Specifications

Weights

Total Vehicle Weight: 6,000 lbs (2,722 Kg)

Vehicle Only Weight: 2,115 lbs (959 Kg)

Carriage, 4 Jaws: 3,885 lbs (1,762 Kg)

Carriage, 3 Jaws: 1,412 lbs (640 Kg)

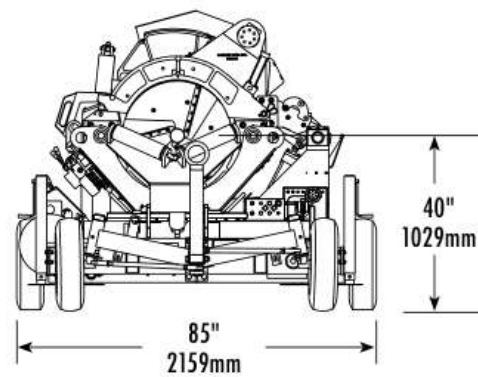
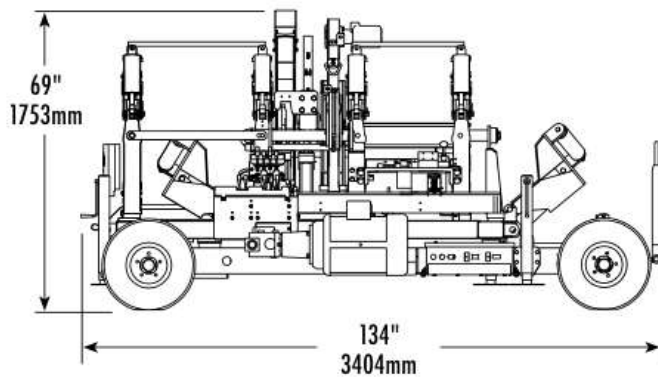
Outer Fixed Jaw: 185 lbs (84 Kg)

Facer: 390 lbs (177 Kg)

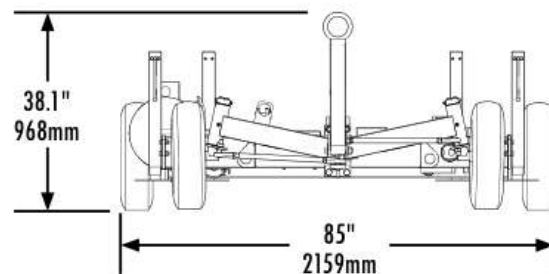
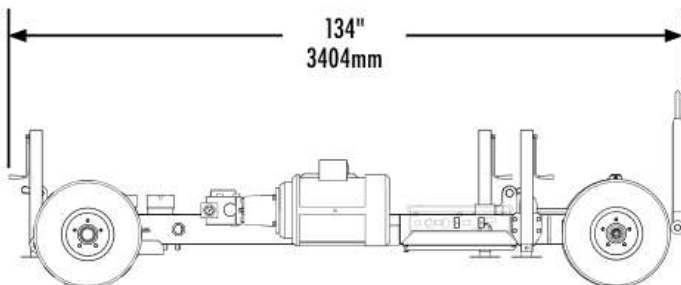
Heater: 240 lbs (109 Kg)

Lifting Device (Spreader Bar): 175 lbs (79 Kg)

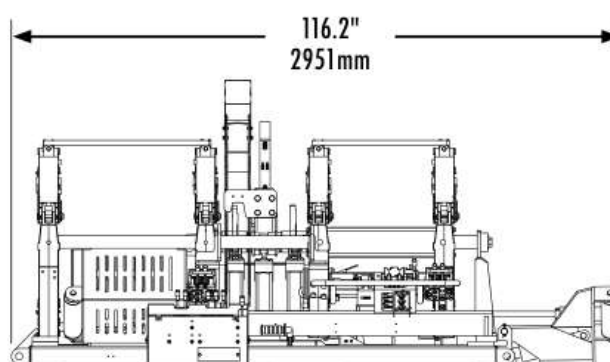
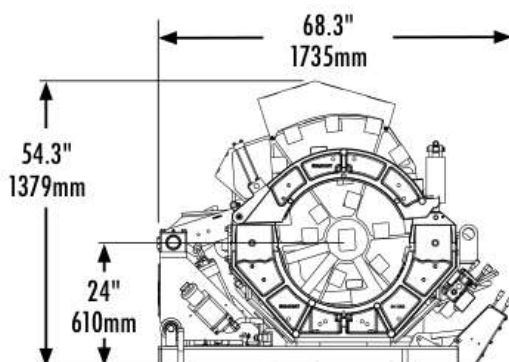
Dimensions



FUSION MACHINE



VEHICLE ONLY



4-JAW CARRIAGE



Specifications

MegaMc® 824 Series 2 Specifications (continued)

Carriage

Maximum Pipe Diameter: 24" OD (630mm)

Minimum Pipe Diameter: 8" IPS (225mm)

Low Force	Effective Piston Area: 9.45 sq in (60.8 sq cm)
	Maximum Force: 21,689 lbs (9,836 kg)
Medium Force	Effective Piston Area: 15.32 sq in (98.8 sq cm)
	Maximum Force: 35,236 lbs (15,980 kg)
High Force	Effective Piston Area: 29.44 sq in (189.9 sq cm)
	Maximum Force: 67,712 lbs (30,708 kg)

Motor

Motor: 20HP, 3 Phase, 220-240V, 50/60Hz

Minimum Power Requirement: 220-240V, 29.8kVA/28.1kW

Hydraulics

Reservoir Capacity: 28 gal (106 liters)

Operating System pressure: 2,300 PSI (158 bar)

Maximum carriage fusing pressure: 2,300 PSI (158 bar)

Heater

Power: 10,950 Watt

Mobility

Tires: 6.90-9NHS, 75 PSI Max

Front Axle: Articulating

Transport: Pulled via towing ring (Do not exceed 5 m.p.h.)

Specifications

MegaMc® 1236 Series 2 Specifications

Weights

Total Vehicle Weight: 6,885 lbs (3,123 Kg)

Vehicle Only Weight: 2,115 lbs (959 Kg)

Carriage, 4 Jaws: 4,770 lbs (2,164 Kg)

Carriage, 3 Jaws: 1,745 lbs (792 Kg)

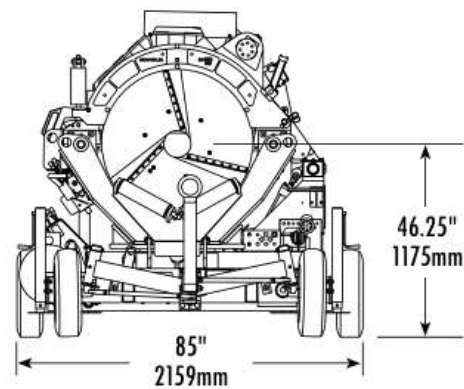
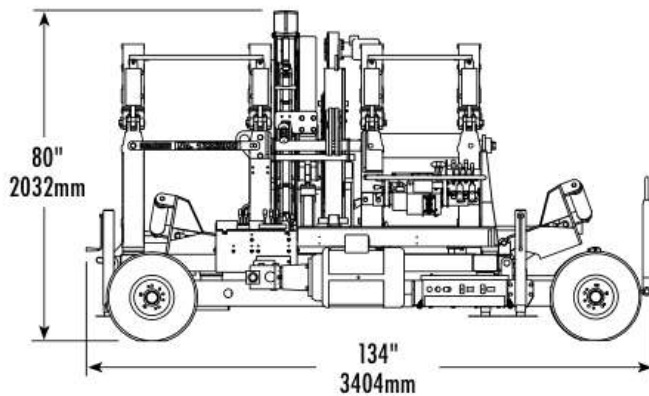
Outer Fixed Jaw: 337 lbs (153 Kg)

Facer: 480 lbs (218 Kg)

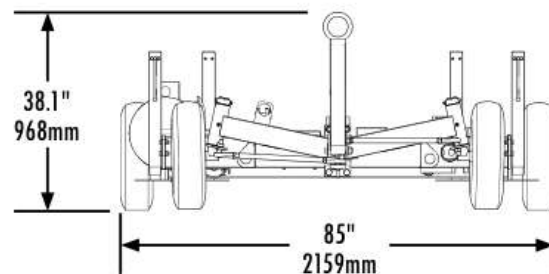
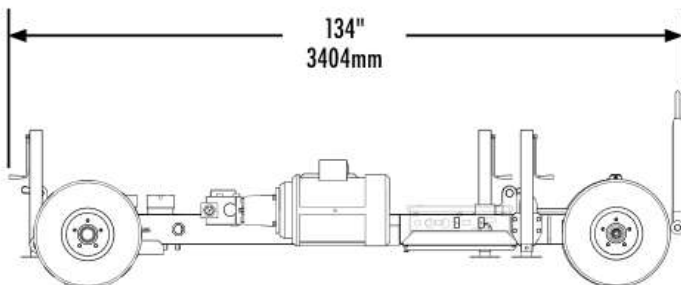
Heater: 382 lbs (173 Kg)

Lifting Device (Spreader Bar): 175 lbs (79 Kg)

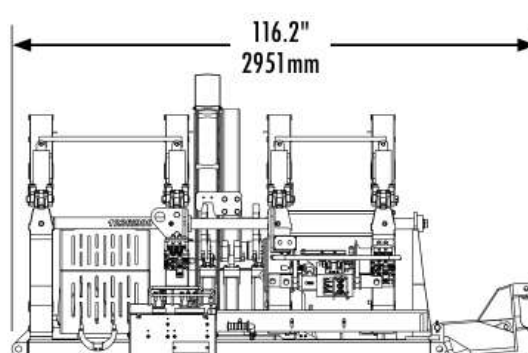
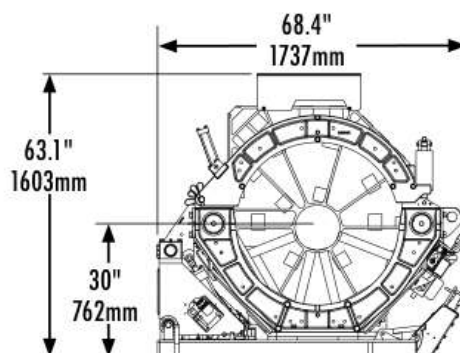
Dimensions



FUSION MACHINE



VEHICLE ONLY



4-JAW CARRIAGE



Specifications

MegaMc® 1236 Series 2 Specifications (continued)

Carriage

Maximum Pipe Diameter: 36" OD (1200mm)

Minimum Pipe Diameter: 12" IPS (340mm)

Low Force	Effective Piston Area: 9.45 sq in (60.8 sq cm)
	Maximum Force: 21,689 lbs (9,836 kg)
Medium Force	Effective Piston Area: 15.32 sq in (98.8 sq cm)
	Maximum Force: 35,236 lbs (15,980 kg)
High Force	Effective Piston Area: 29.44 sq in (189.9 sq cm)
	Maximum Force: 67,712 lbs (30,708 kg)

Motor

Motor: 20HP, 3 Phase, 220-240V, 50/60Hz

Minimum Power Requirement: 220-240V, 39.4kVA/37.7kW

Hydraulics

Reservoir Capacity: 28 gal (106 liters)

Operating System pressure: 2,300 PSI (158 bar)

Maximum carriage fusing pressure: 2,300 PSI (158 bar)

Heater

Power: 20,461 Watt

Mobility

Tires: 6.90-9NHS, 75 PSI Max.

Front Axle: Articulating

Transport: Pulled via towing ring (Do not exceed 5 m.p.h.)

About this manual . . .

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

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

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



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