

Operator's Manual

Asahi/America, Inc.

ProWeld® Equipment

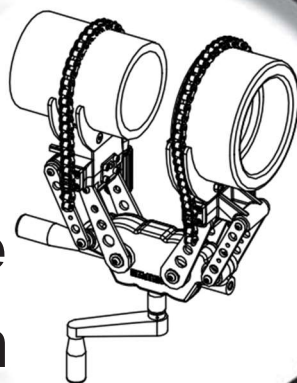


800-343-3618

Powered by



Polypropylene Socket Fusion Tooling System including Spider™ 125 Chain Clamping



Patent Pending

Original Language: English

Manual: SW20901 Revision: F 08/15

**California
Proposition 65 Warning**

This product could expose you to chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

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



Introduction



Thank You for purchasing this McElroy product

The McElroy Polypropylene Socket Fusion Tooling System is designed for socket fusion on 16mm to 125mm pipe.

With reasonable care and maintenance, these tools will give years of satisfactory service.

Before operating these tools, please read this manual thoroughly, and keep a copy with the tools for future reference. This manual is to be considered part of your Socket Fusion Tooling System.

TX04420-02-10-15

Asahi/America Training Standards

Since 1984, Asahi/America, Inc. has been teaching contractors the benefits of welding thermoplastic piping systems in industrial and high purity applications. Our partnership with McElroy allows us to leverage their state-of-the-art Learning Management System (LMS) using Asahi/America technical standards across all Asahi piping systems.

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. Asahi/America learning portal classes powered by McElroy University are structured so that the skills learned and the machines used in each class closely match the machines found on pipelining jobsites.

Training modules specific to Asahi/America piping systems available for purchase online and required to be completed prior to onsite training by Asahi/America personnel.

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 cannot encompass all possible situations that can be encountered during various operations.

TX04659-03-21-14

MU2-03-13-14



Foreword



LITERATURE INFORMATION

This manual should be stored in a protected location for future reference. Use the literature holder if provided with the product. This manual contains safety information, operation instructions, transportation information, lubrication information and maintenance information. Some photographs or illustrations in this publication show details or equipment that can be different from your machine. Guards and covers might have been removed for illustrative purposes. Continuing improvement and advancement of product design might have caused changes to your machine which are not included in this publication. Read, study, and keep this manual with the machine. Whenever a question arises regarding your machine, or this publication, please contact Asahi/America Technical Services at 1-800-343-3618 or pipe@asahi-america.com.

SAFETY

The safety section lists basic safety precautions. In addition, this section identifies the text and locations of warning signs and labels used on the machine. Read and understand the basic precautions listed in the safety section before operating or performing maintenance and repair on this machine.

OPERATION

The operation section is a reference for the new operator and a refresher for the experienced operator. This section includes a discussion of gauges, switches, machine controls, accessories, and transportation. Photographs and illustrations guide the operator through correct procedures of setting up, checking, and operating the machine. Operating techniques outlined in this publication are basic. Proficiency develops as the operator gains knowledge and experience with the machine and its capabilities.

MAINTENANCE

The maintenance section is a guide to equipment care. The maintenance schedule lists the items to be maintained at a specific service interval. Items without specific intervals are listed under the "As Needed" service interval. The schedule lists the page for the step-by-step instructions required to accomplish the scheduled maintenance. Use the schedule as an index for all maintenance procedures. Some maintenance procedures may be referenced in a manual pertaining to that component of the machine. For example, maintenance for an engine component would have its intervals and procedures in the engine operator's manual. Use the hour meter (if equipped) to determine servicing intervals. Calendar intervals will be used instead of hour meter intervals if no hour meter is equipped on a machine. Recommended service should always be performed at the interval that occurs first. Under extremely severe, dusty, or wet operating conditions, more frequent lubrication than is specified in the maintenance schedule might be necessary.



Foreword



PATENT INFORMATION

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

REPLACEMENT LITERATURE

This product is shipped with a printed operator's manual. If the manual becomes lost or damaged, order a replacement manual or download and print a copy of the manual from our website at https://www.asahi-america.com/images/x-assets/PDF/Datasheet_McElroy_Hand_Held_Socket.pdf.

NAMEPLATE LOCATIONS

Every machine has a name plate that includes the machine's model number, serial number, and power requirements. The model and serial numbers can be used to register the machine online and activate the warranty. Reference warranty card for information on registering your product. Asahi America's rental tools also have the rental serial number on tool and shipping crate, as well. This serial number required when calling Asahi America with questions for rental tools.

REPLACEMENT PARTS

Contact Asahi/America for replacement parts on Asahi-owned rental tools. Refer to the McElroy parts finder at www.mcelroy.com to locate parts for purchase. Reference the model number on the nameplate of the machine when using the parts finder. Contact your McElroy distributor to order replacement parts. Find your closest distributor on our website at www.mcelroy.com.



Warranty



ASAHI/AMERICA RENTAL WARRANTY

Asahi/America's comprehensive rental equipment policies can be found on our website here: <https://www.asahi-america.com/support/rental-equipment-policy>

All rental equipment is warranted for six (6) months of on-site usage. All tool failures within this six-month period are handled as indicated in Section V. After six months usage it is recommended that the equipment be returned for regular maintenance and warrantee renewal. Equipment held longer than six months without return is held at the renter's risk.

USED EQUIPMENT WARRANTY

Purchase of refurbished/used equipment carries a 90-day warranty.

NEW EQUIPMENT WARRANTY

Purchase of new Asahi/America versions of McElroy equipment carries a 5-year limited warranty. Details can be found here: <https://www.mcelroy.com/warranty.htm>

ASAHI/AMERICA TOOL DEPARTMENT CONTACTS

For technical or tool related questions, please contact:

Rental Equipment Manager – 781-388-4618 or toolmanager@asahi-america.com

For Rental Administration, Billing, and Returns – 781-388-4623 or toolrental@asahi-america.com

Welding and Standards Manager – 781-388-4577

To schedule field service or training, please enter information here: <https://www.asahi-america.com/support/field-technician-request>

For technical service related questions, please contact:

High Purity, Double Wall, or Industrial Piping – 781-321-5409 or pipe@asahi-america.com

Asahi/America Corporate Headquarters – 800-343-3618 or asahi@asahi-america.com

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Lawrence, MA 01843



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Tulsa, Oklahoma, USA

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Fusion Equipment Safety



Safety Alerts



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

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



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.



WR00051-11-30-92

TX00030-12-1-92

Read and Understand

Do not operate this equipment until you have carefully read, and understand all the sections of this manual, and all other equipment manuals that will be used with it.

Your safety and the safety of others depends upon care and judgment in the operation of this equipment.

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

McElroy Manufacturing, Inc. cannot anticipate every possible circumstance that might involve a potential hazard. The warnings in this manual and on the machine are therefore not all inclusive. You must satisfy yourself that a procedure, tool, work method, or operating technique is safe for you and others. You should also ensure that the machine will not be damaged or made unsafe by the method of operation or maintenance you choose.



WR00052-12-1-92

TX02946-4-15-09



Fusion Equipment Safety



General Safety

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

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

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

FEEL any changes in the way the equipment operates.

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

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



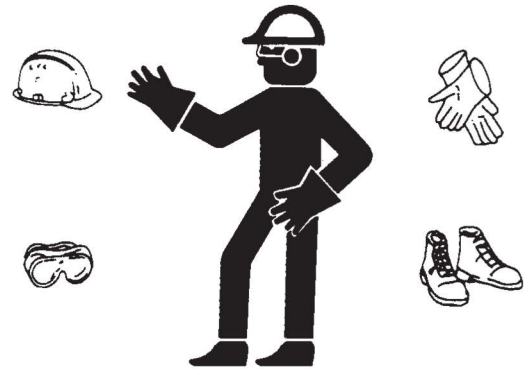
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Wear Safety Equipment

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

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



WR00053-12-2-92

TX00032-4-7-93

Heater Is Not Explosion Proof



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

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



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TX04378-8-4-14



Fusion Equipment Safety



Electrical Safety



Always ensure power cords are 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.

Do not carry electrical devices by the cord.



WR00055-4-7-93

WR00025-11-30-92

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Overhead Loads



The Spider™ 125 is not designed to support overhead or overhung loads. Adequately support the pipe using appropriate support devices. If not supported, overhead loads could fall causing serious injury or death.



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Heater is Hot



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

NOTICE: Use only a clean non-synthetic cloth such as a cotton cloth to clean the heater plates.



WR00030-2-10-93

TX00104-8-12-94



Fusion Equipment Safety



Fusion Procedures

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

NOTICE: Failure to follow pipe manufacturer's procedure could result in a bad joint. Always follow pipe manufacturer's procedures.

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WR00079-1-24-96

Theory of Heat Fusion

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

The principal operations include:

- Clamping** The pipe pieces held axially to allow all subsequent operations to take place.
- Facing** The pipe ends must be faced to establish clean, parallel mating surfaces perpendicular to the centerline of the pipes.
- Aligning** The pipe ends must be aligned with each other to minimize mismatch or high-low of the pipe walls.
- Heating** A melt pattern that penetrates into the pipe must be formed around both pipe ends.
- Joining** The melt patterns must be joined with a specified force. The force must be constant around the interface area.
- Holding** The molten joint must be held immobile with a specified force until adequately cooled.
- Inspecting** Visually examine the entire circumference of the joint for compliance with standards established by your company, customer, industry, federal, state, or local regulations.

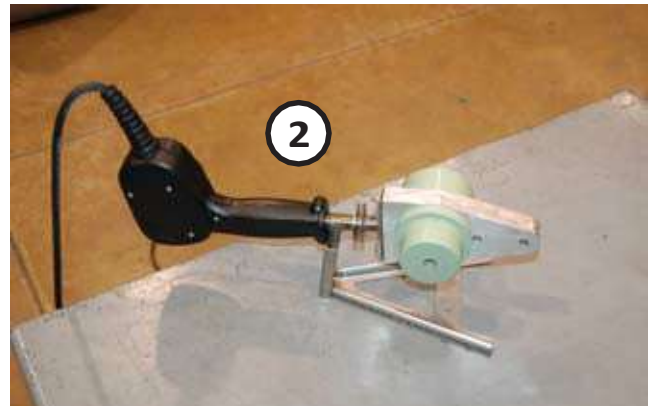


Nomenclature

- ① **Heater Sling** - Sling used to hold the heater that protects and insulates the heater.
- ② **Heater and Heater Stand** - Used with heater adapters in order to heat the pipe and fitting so that they can be fused.
- ③ **Heater Adapters** - Used with the heater and should be installed to match the fitting and pipe being fused.
- ④ **Pipe Cutters** - Used to cut the pipe to remove any damaged or misshaped material.
- ⑤ **Socket Fusion Toolbox** - Holds the heater, heater adapters, pipe cutters, heater stand, and has a fusion chart attached.



PH04212-6-14-10





Operation - 16-63mm



Prepare Pipe End

Cut off damaged or oval ends of pipe squarely with a pipe cutter.
Remove shavings and burrs inside pipe end.



PH04675-5-15-12

TX04408-5-22-12

Mark Insertion Depth

Place the depth gauge on the end of the pipe.
Use a marking instrument and fill in the circle appropriate for the pipe size that is being fused.
This mark is the insertion depth used when fusing the pipe and fitting.



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Clean Fitting and Pipe

Fitting and pipe must be clean and dry. Use a clean cloth to wipe the mating surfaces.

NOTICE: Do not touch fusion area with hands.



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PH04672-5-15-12

TX04462-9-25-12



Operation - 16-63mm



Heater Is Not Explosion Proof



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

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

Use a clean nonsynthetic lint free cloth to clean the heater adapter surfaces.

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PH04673-5-15-12

Heater Temperature

The socket faces of the heater must be at the temperature 500°F ±18° (260°C ±8°) per DVS standard.

Use a pyrometer to check the temperature on the socket faces.

If the temperature needs to be adjusted, refer to "Adjusting Heater Temperature" in the Maintenance section of this manual.

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Heating The Pipe and Fitting

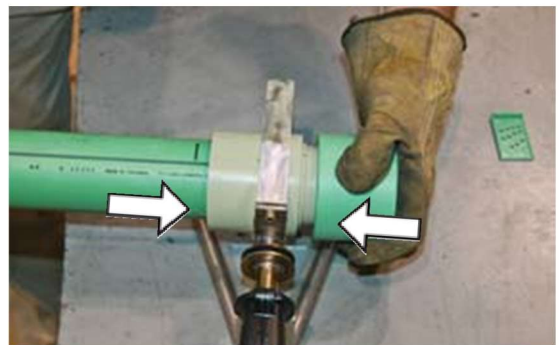
Firmly seat the socket fitting on the male adapter of the heater.

Simultaneously place the female adapter of the heater over the end of the pipe, up to the marked insertion depth.

Heating time starts when the heater is inserted to the proper insertion depth.

Heat fitting and pipe for the time specified by the chart on the toolbox.

NOTICE: Do not twist fitting, pipe or heater



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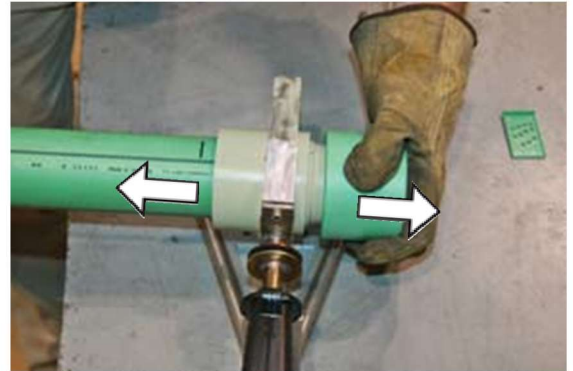
Operation - 16-63mm



Remove Heater

Remove the pipe and the fitting from the heater.

NOTICE: Do not twist fitting, pipe or heater.



PH04677-5-15-12

TX04458-9-25-12

Inspect Melt

Quickly inspect the heated parts to make sure all surfaces have been melted properly.

If melt is not complete, cut off melted pipe end. Use a new fitting and repeat preparation and heating process.

TX01408-6-20-97

Fusion and Cooling

Within the welding time, after the heater has been removed, firmly push the melted fitting squarely onto the pipe to the marked insertion depth.

NOTICE: Do not twist or rotate the fitting.

Hold the fitting firmly in place for the total cooling time specified by chart on the toolbox.



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TX04412-02-10-15

Inspecting Fusion Joint

After completing the specified cooling time, inspect the joint. A good joint will have a uniform melt ring.

There should be no gaps or voids between the fitting and the pipe.

If the joint is not acceptable, cut off the joint and re-fuse the joint.



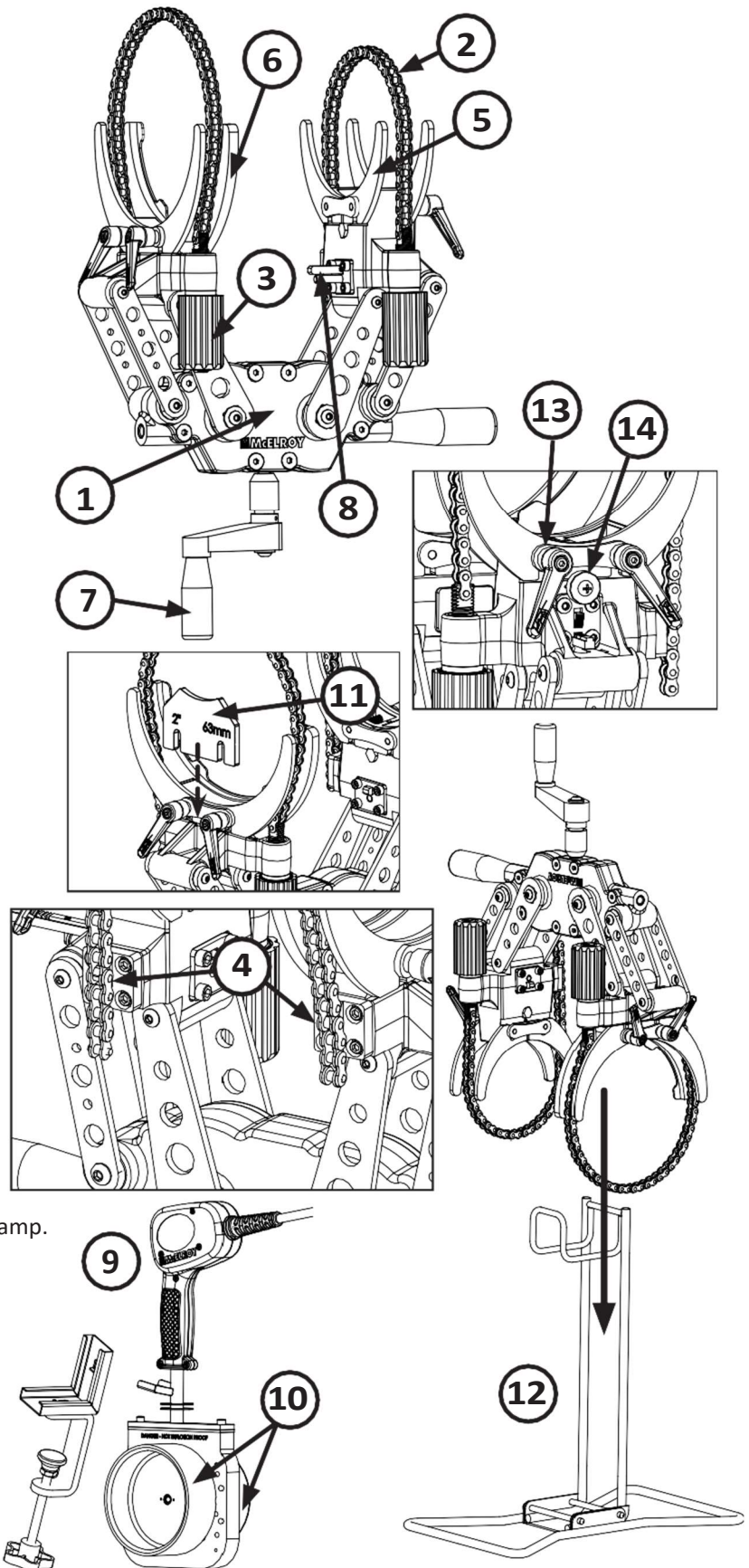
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Nomenclature

- ① **Spider™ 125 with Chain Clamping** - Is an assembly tool that has two jaw blocks with inserts attached and can move the inserts toward or away from each other.
- ② **Clamp Chains** - Wrap around the pipe and fitting to secure them to the assembly tool.
- ③ **Clamp Chain Clamp Knobs** - Used to tighten the clamp chains to the assembly tool.
- ④ **Clamp Chain Attachment Hooks** - Hooks that fit between the chain links to secure the chains to the assembly tool.
- ⑤ **Pipe Insert** - Insert used to hold the pipe in the assembly tool. The correct size insert must be matched with the size pipe used.
- ⑥ **Fitting Insert** - Insert used to hold the fitting in the assembly tool. The correct size insert must be matched with the size fitting used.
- ⑦ **Crank Handle** - Handle used to move the inserts toward or away from each other.
- ⑧ **Stab Depth Gauge** - Set the desired stab depth determined by the size pipe and fitting to be fused.
- ⑨ **Heater and Heater Stand** - Used with heater adapters in order to heat the pipe and fitting so that they can be fused.
- ⑩ **Heater Adapters** - The correct size adapters should be installed to match the size pipe and fitting used.
- ⑪ **Narrow Insert** - Can be used when the gripping area is too short for a standard fitting. This insert is used outside the standard fitting insert.
- ⑫ **Assembly Tool Stand** - Holds the assembly tool when it is not in use.
- ⑬ **Quick Release Insert Clamp** - Secures the inserts to the tool base and does not require any additional tools to tighten or loosen the clamp.
- ⑭ **Alignment Cam** - A five position cam that adjusts the vertical alignment of the pipe so it matches the fitting.



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CD01099-2-26-13

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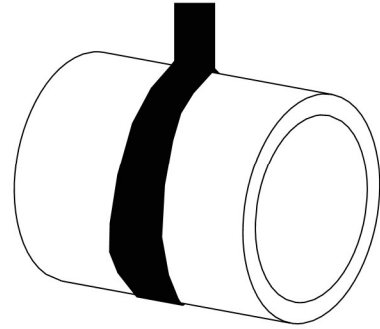
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Support Pipe

Ensure the pipe is properly supported before attaching the assembly tool to the pipe. Ensure there is enough travel in the pipe to complete the fusion.

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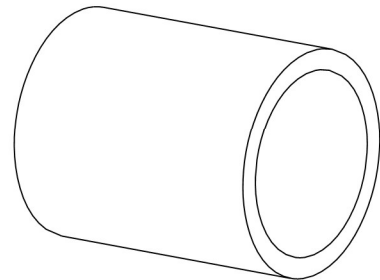


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Prepare Pipe End

Cut off damaged or oval ends of pipe squarely with a pipe cutter. Remove shavings and burrs inside pipe end.

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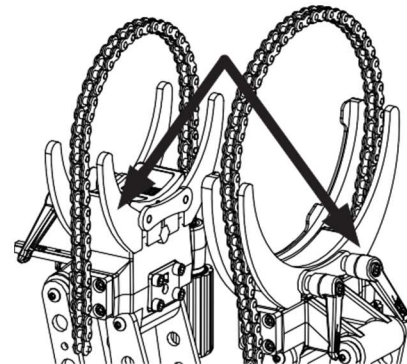


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Inserts

Select the appropriate fitting and pipe inserts and attach them to the jaw blocks of the assembly tool using the quick release insert clamps.

TX04460-2-26-13



CD01100-2-26-13

Heater Adapters

Select the appropriate heater adapters for the size of fitting and pipe being fused together.

The heater body of this assembly is not coated. Coated heater adapters are available for all fusion applications.

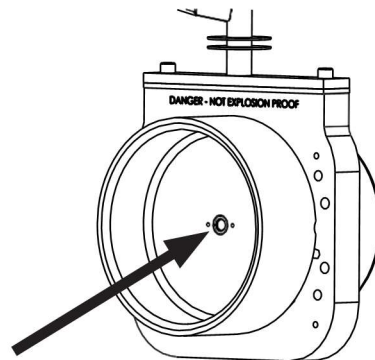
Heater adapters are installed with stainless steel cap screws.

Care should be taken to assure that the heater adapters are seated on the heater body, and that there is no foreign matter trapped between these surfaces.

IMPORTANT: Do not over-tighten the bolts.

The surface of the heater adapters are coated with an anti-stick coating.

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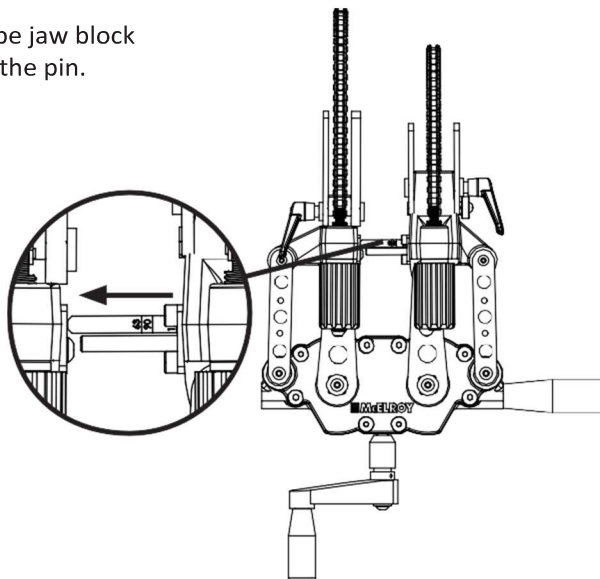


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Set Insertion Depth

Push in the stab depth gauge, located in the jaw block of the pipe jaw block to the desired depth which is denoted by the pipe diameter on the pin.



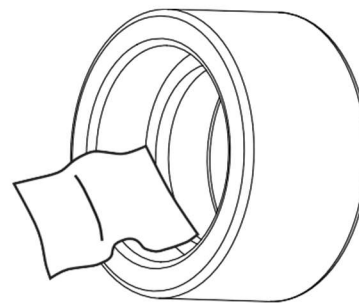
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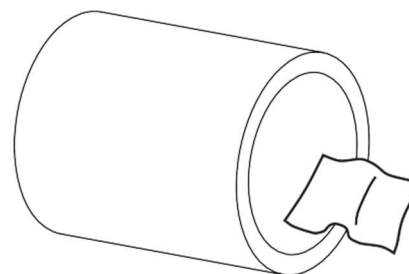
Clean Fitting and Pipe

Fitting and pipe must be clean and dry. Use a clean cloth to wipe the mating surfaces.

NOTICE: Do not touch fusion area with hands.



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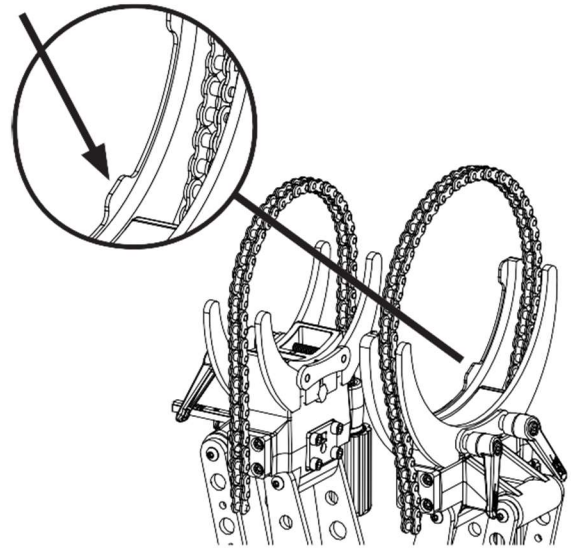
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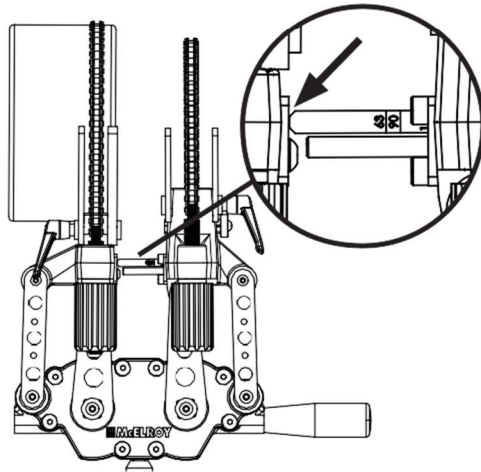
Attach Spider 125 to Fitting and Pipe

Insert the fitting into the fitting insert ensuring that the fitting is square to the stop tabs. Wrap chain over the fitting and secure chain to the attachment hooks. Tighten the chain with the clamp knob.

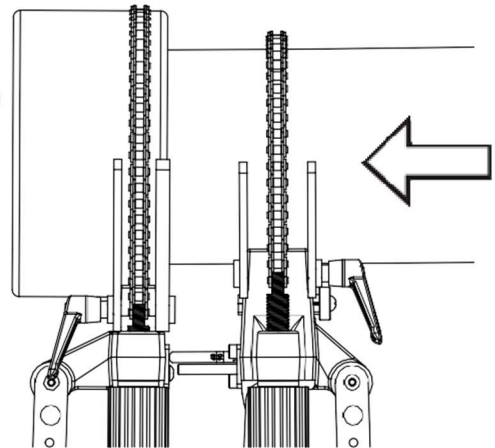


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Bring the jaws together until the stab gauge that was set earlier is making contact with the stop plate on the fitting jaw block.

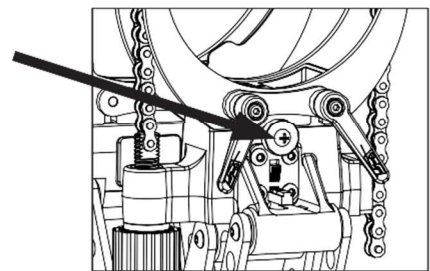


Insert pipe into the pipe insert, butting the end of the pipe against the fitting. Wrap chain over the pipe and secure chain to the attachment hooks. Tighten the chain with the clamp knob.



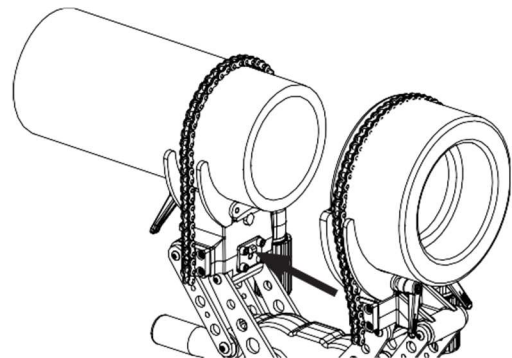
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Check the vertical alignment of the pipe to the fitting and adjust the 5 position adjustment cam to move the pipe in the desired direction.



CD01101-2-26-13

Open the jaws and release the stab depth gauge by sliding the latching mechanism up, allowing the pin to retract.



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Heater Is Not Explosion Proof

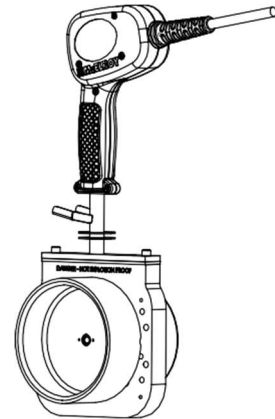


This heater is not explosion proof. Operation of heater in an explosive atmosphere without necessary safety precautions will result in serious injury or death.

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

Use a clean nonsynthetic lint free cloth to clean the heater adapter surfaces.

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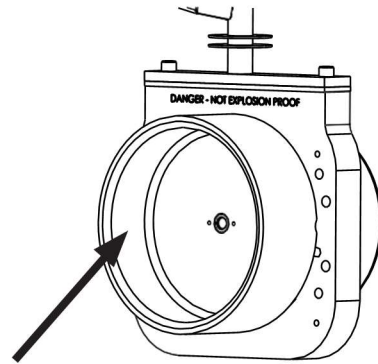
Heater Temperature

The socket faces of the heater must be at the temperature 500°F ±18° (260°C ±8°) per DVS standard.

Use a pyrometer to check the temperature on the socket faces.

If the temperature needs to be adjusted, refer to "Adjusting Heater Temperature" in the Maintenance section of this manual.

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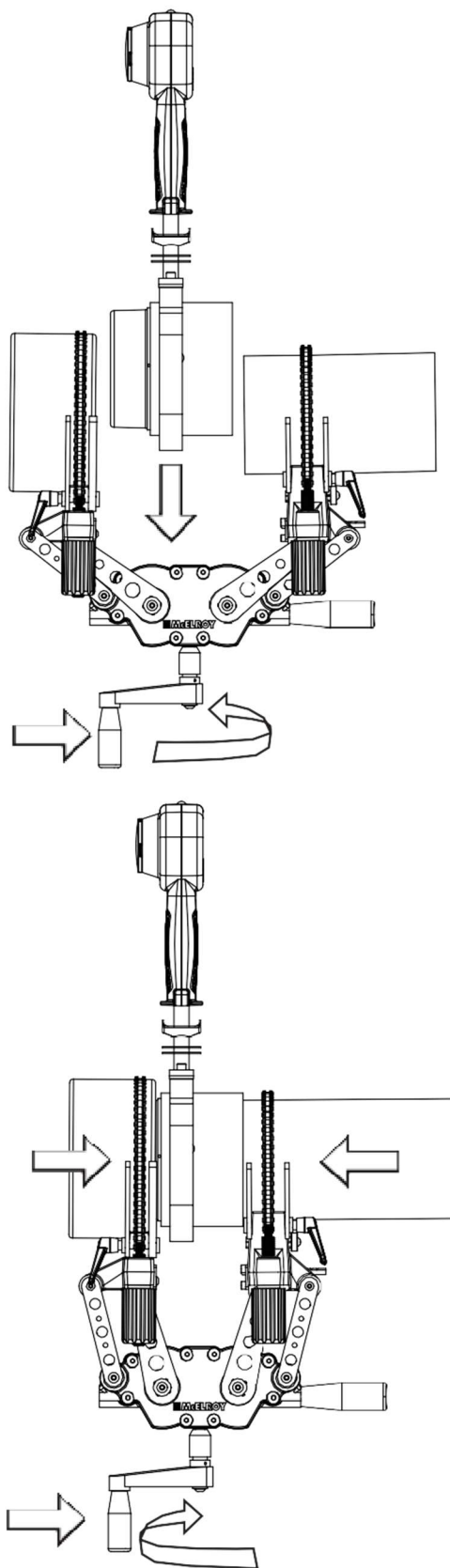
Heating The Pipe and Fitting

Insert the heater in between the pipe end and fitting. Rotate the crank handle moving the pipe and fitting onto the heater. Move the jaws onto the heater to the proper welding depths.

IMPORTANT: Do not force the pipe and fitting onto the heater. Allow the pipe and fitting to melt onto the heater. Forcing the pipe and fitting onto the heater will damage the assembly tool.

Heating time starts when the pipe and fitting are fully inserted onto the heater adapters.

Heat fitting and pipe for the pipe manufacturer's specified period of time or according to the chart on the toolbox.



CD01108-2-26-13

PH04726-9-18-12

CD01106-2-26-13



Operation - Spider™ 125 with Chain Clamping (63-125mm)

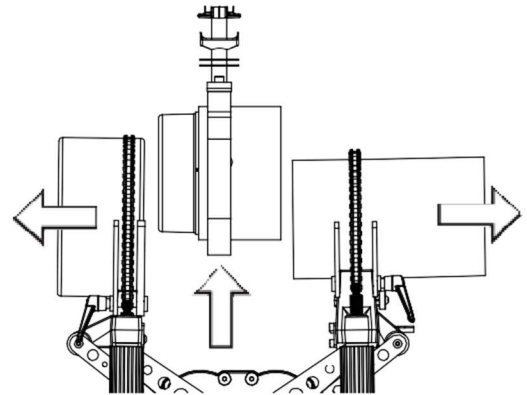


Remove Heater

Rotate the crank handle and open the jaws until there is enough room to remove the heater. Quickly remove the heater from the pipe and fitting.

IMPORTANT: An optional auxiliary heater handle is available to assist with removing the heater.

TX04417-9-25-12



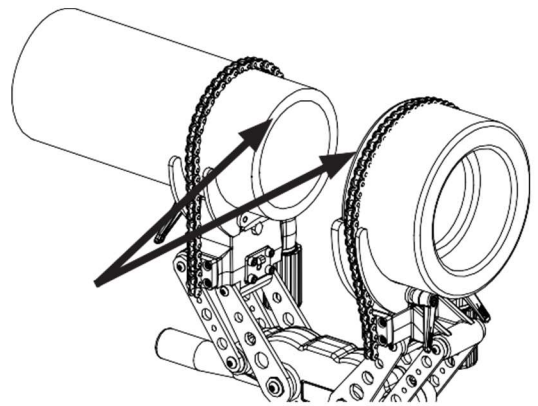
CD01108-2-26-13

Inspect Melt

Quickly inspect the heated parts to make sure all surfaces have been melted properly.

If melt is not complete, cut off melted pipe end. Use a new fitting and repeat preparation and heating process.

TX01408-6-20-97



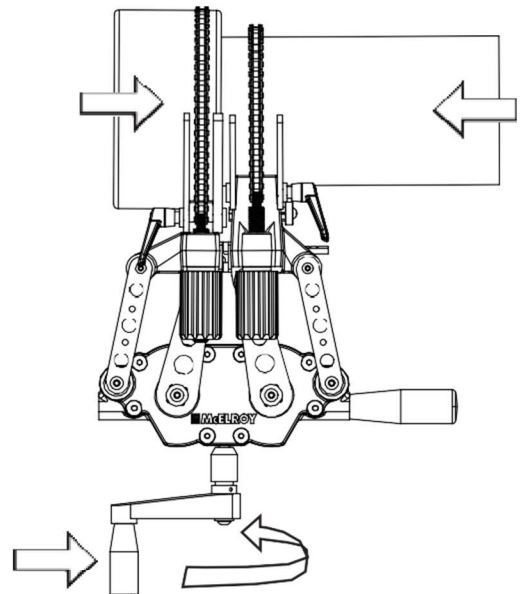
CD01110-2-26-13

Fusion and Cooling

Within the welding time, after the heater has been removed, rotate the crank handle and close the jaws completely together.

Allow the jaws to stay in place for the total cooling time specified by the chart on the toolbox.

TX04418-02-10-15



CD01107-2-26-13

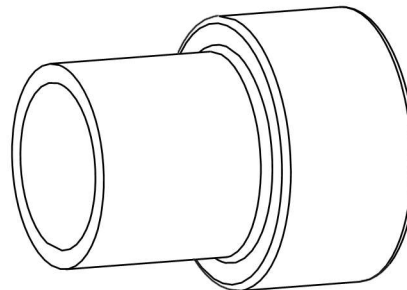
PH04726-9-18-12



Inspecting Fusion Joint

After completing the pipe manufacturer's specified cooling time, remove the fused pipe and fitting from the assembly tool. Inspect the fused pipe and fitting. A good joint will have a uniform melt ring.

There should be no gaps or voids between the fitting and the pipe.



CD00996-5-22-12

TX04419-02-26-13



Maintenance



Preventative Maintenance

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

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

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



TX00428-8-10-95

CD00142-11-2-94

Cleaning the Machine

Clean the machine with a soap and water wash as needed. Remove the heater from the spray area before cleaning.



TX04463-9-25-12

CD00178-5-3-96

Lubrication

The assembly tool is sealed and does not require any lubrication.

Do not lubricate the clamp chains.

TX04464-2-26-13



Installing Socket Fusion Heater Adapters

The heater body of this assembly is not coated. Coated heater adapters are available for all fusion applications.

Heater adapters are installed with stainless steel cap screws.

Care should be taken to assure that the heater adapters are seated on the heater body, and that there is no foreign matter trapped between these surfaces.

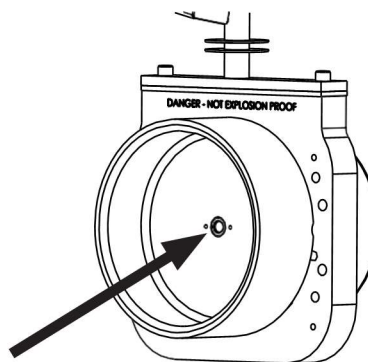
IMPORTANT: Do not over-tighten the bolts.

The surface of the heater adapters are coated with an anti-stick coating.

NOTICE: Only install heater adapters when the heater is cool.



PH04669-5-15-12



CD01001-5-22-12

TX01413-6-17-10

Adjusting Heater Temperature

The heater is pre set to 500°F at 70° ambient temperature. Before using the heater it should be allowed to reach operating temperature (10 minutes).

Once the heater has reached operating temperature, check the adapters with a pyrometer. If the temperature needs adjustment, remove the clear cap and change the temperature in less than 10° increments and allow 5 minutes for the heater temperature to stabilize. Check for proper operating temperature again using the pyrometer. If needed, repeat the adjustment of the temperature until the operating temperature of 500°F. is reached. Replace the clear cap.



PH04681-5-15-12

TX04452-9-19-12



Heater Indicator Light

The heater has a green indicator light which will flash on and off. This indicates that the controller is operating normally. If the green indicator is not flashing then the controller may not be operating properly. If this occurs, disconnect power and have the heater repaired by an McElroy Authorized Service Center.

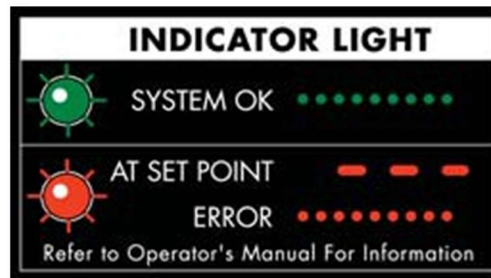
The heater has a red indicator light on the handle at the bottom of the temperature scale. When the heater is plugged in and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

If the heater is not operating properly, the control will attempt to turn the heater off and the red indicator light will flash rapidly. If this occurs, disconnect the power and take it to a McElroy Authorized Service Center for repair.

TX04036-4-12-10



PH04682-5-15-12



PH02571-09-16-03



Specifications



Specifications

The McElroy Polypropylene Socket Fusion Tooling System is designed for socket fusion of 16mm to 125mm pipe.

Heaters:

16mm - 63mm Socket Heater Power - 100V - 120V, 50/60Hz, 700 Watt, 1Ph

Large Socket Heater Power - 100V - 120V, 50/60Hz, 1600 Watt, 1Ph

Weight:

16mm - 63mm Socket Heater: 3.5 lbs. (1.6 Kg)

Larger Socket Heater: 5.5 lbs. (2.5 Kg)

Toolbox Dimensions:

Length: 24" (609.6mm)

Width: 10" (254mm)

Height: 9.5" (241.3mm)

Spider™ 125 with Chain Clamping

Weight: 13 lbs. (5.90 Kg)

Dimensions:

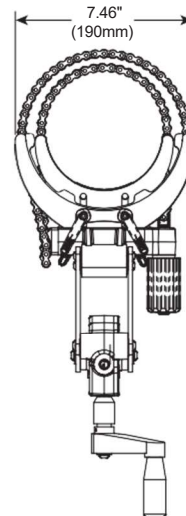
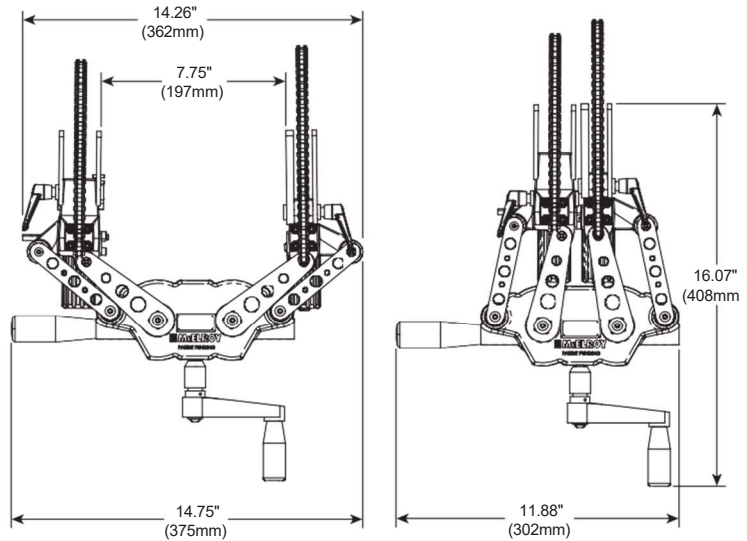
Length: 14.75" (375mm)

Width: 7.46" (190mm)

Height: 16.07" (408mm)

Maximum Stroke: 7.6" (193mm)

Mechanical Advantage: 20 to 1





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