

# Operator's Manual



# McELROY

[www.mcelroy.com](http://www.mcelroy.com)



## In Field<sup>®</sup> Tensile Tester

Manual: S03401 Revision: D 12/18

Original Language: English



**WARNING**

Cancer and Reproductive Harm -  
[www.P65warnings.ca.gov](http://www.P65warnings.ca.gov)

8163361

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](http://patent.mcelroy.com)

# Introduction

## Thank You for purchasing this McElroy product

The In Field® Tensile Tester provides a quick and easy way to qualitatively test joints in the field. A hand pump system tests coupons from 2" IPS and larger pipes (up to 5" thick wall). To create the coupon, a template is attached to the pipe's outer wall, where a drill and reciprocating saw produce the coupon in minutes. The coupon is then inserted into the hand pump tensile test unit. The dual reduced section coupon allows failure in either the parent pipe material or the fusion joint, depending on joint quality. This makes a quick and easy evaluation of joint integrity compared to the pipe.

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

TX04070-02-24-15

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.



## 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](http://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



MU02-03-13-14

# 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](mailto: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](http://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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# Fusion Equipment Safety

VR00051-1-30-92

## 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

## 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.



VR00052-12-1-92

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.



SAFE1ST-122292

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



WR00053-122-92

TX00032-4-7-93

## Power Tool Safety

### ⚠ WARNING

Read and understand the all instructions provided with your drill and saw. Failure to follow all the drill and saw instructions, may result in electric shock, fire and/or serious personal injury.



WR00080-4-12-93

WR00055-4-7-93

TX04087.3-2-11

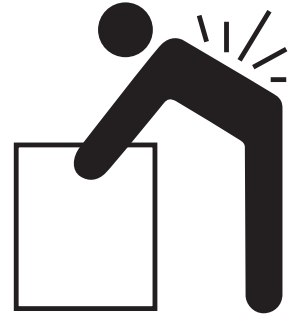


# Fusion Equipment Safety

## Lifting Safety



The machine weighs 105 lbs. (48 Kg). Using one person to lift the machine may result in injury. Two people are required to lift the machine.



HeavyLifting5:25:10

TX04091-525-10

# Overview

## Tensile Tester

The tensile tester is a hydraulic hand pump machine that is used to test fusion joint coupons. The coupon is loaded into the machine and the hand pump is used to pressure a hydraulic cylinder that pulls the fusion coupon to test it.

**IMPORTANT:** The tensile tester should only be used to perform tests on coupons that were created from fusions of like pipes.

The tester has a gauge and DataLogger® port on the machine. These items are used for reference and are not considered part of the qualitative testing process.



PH04521-3-2-11

TX04065-1-31-11

## Pump

The tensile tester has a manually operated hydraulic pump that is used to apply hydraulic pressure to the hydraulic cylinder in order to move the clevis. The pump has a pressure release valve on the lower left side of the pump.



PH04522-3-2-11

TX04066-5-25-10

# Overview

## Pressure Relief Valve

Used to unload pressure in the hydraulic cylinder. Push toward the machine to unload pressure and pull toward to close the valve.

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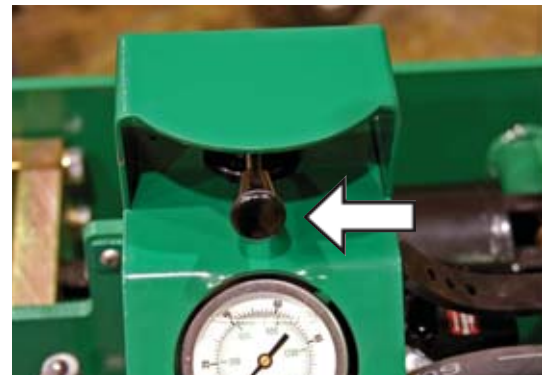


PH04154-5-20-10

## Directional Valve

The directional valve that controls the direction of the cylinder. Move the valve to the left to move the cylinder left and move the valve to the right to move the cylinder right. The center position is a neutral position.

TX04068-5-25-10

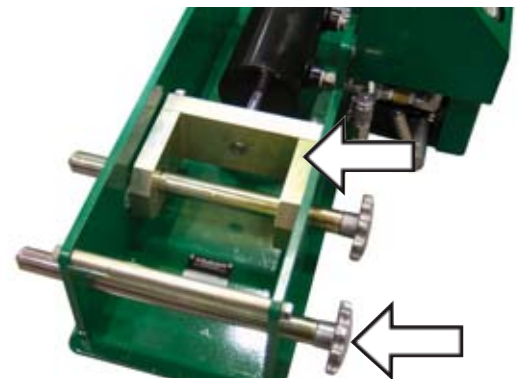


PH04155-5-20-10

## Clevis and Pins

Used for the mounting of coupons to be tested. One pin inserts through the clevis and holds one end of the coupon and the other pin inserts through the end of the machine and holds the other end of the coupon.

TX04069-5-25-10



PH04524-3-2-11

## Drill Bit

The drill bit provided with the package is 1" dia with a 1/2" shank 12" long with 9" of flute length.

The long flutes allow the shavings to be cleared in pipe up to 5" wall thickness. When used properly this drill will leave a smooth surface in the drilled holes and provide good tool life in polyethylene.

If the holes in the coupon become rough or "fuzzy", the drill should be inspected for chips or wear on the cutting edges and replace as necessary.

TX04088-5-25-10



PH04164-5-20-10

# Overview

## Template

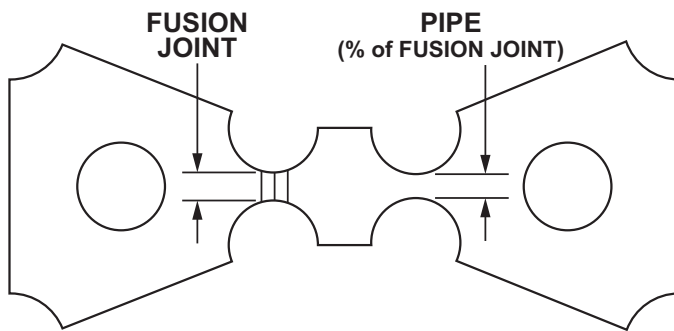
The template is used to position the holes to be drilled for the coupon over the fusion joint.

The template is attached to the pipe with two long wood screws.

For smaller pipe, the template is attached using two long U-bolts and wood screws.

There is an alignment mark on the template that is lined up with the center of the fusion joint.

There are templates available for producing coupons with different width relationships. The coupon will have a fusion joint reduced area and a pipe material reduced area that has a width that is a percentage of the fusion joint reduced area. This gives an advantage to the fusion joint over the pipe material.



Templates are available in 95%, 90%, and 85% width relationships with others upon request. The In Field Tensile Tester includes the 95% coupon template to test the fusion joint reduced area for strength that is equal or exceeds the strength of the pipe material ensuring a high performance fusion joint. If you receive inconsistent results while performing the test, a different percentage template can be used to better understand the performance of the fusion joint.

TX04072-02-24-15-



PH04157-5-20-10



PH04157-5-20-10

CD01275-02-18-15

## Coupon

The coupon is the result of using the template and drilling and sawing out the pipe. The coupon has two reduced areas to test the joint and the pipe.



PH04159-5-20-10

TX04073-5-25-10

# Overview

## Additional Tools

There are some tools that will be required (not included) to complete the preparation of the coupon for testing.

- A reciprocating saw with a coarse woodcutting blade.
- A 1/2" chuck, heavy duty, 650 rpm drill.
- Two #10 deck screws that are 3.5" or longer.
- Electric screwdriver and correct driver bit.
- Needle nose pliers.



PH04168-5-20-10



PH04169-5-20-10



PH04162-5-20-10

# Operation

## Read before Operating

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

TX00838-1-5-96

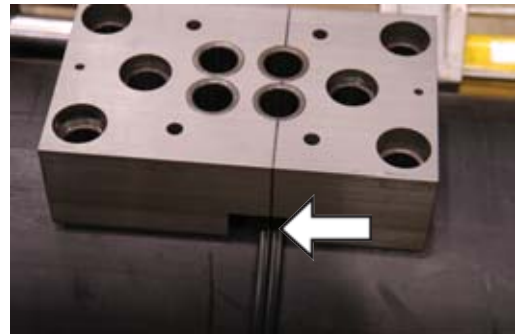


PH01054-220-97

## Attach Template to Pipe (4" or Larger)

Place the template on the pipe, saddle side down. Align the alignment marks on the template with the center of the fusion joint.

Carefully apply deck screws (tighten fully) to fix the template to the pipe without moving the template out of alignment with the fusion.



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PH04162-520-10



PH04161-520-10



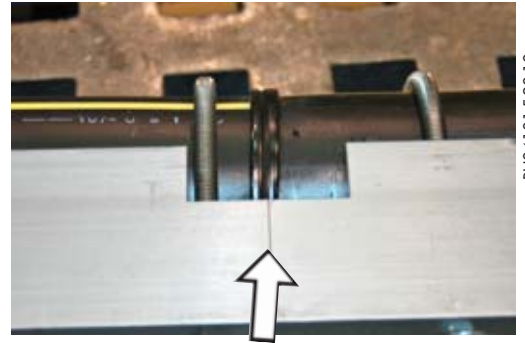
PH04162-520-10

TX04074-5-25-10

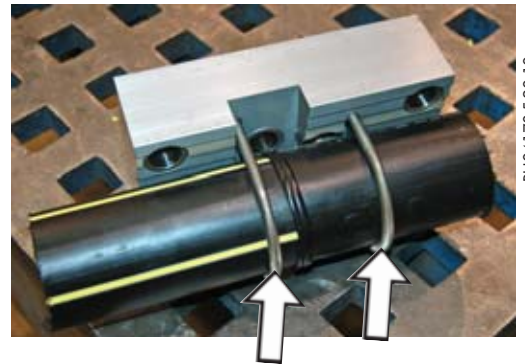
# Operation

## Attach Template to Pipe (2" to 3" Pipe)

Place the template on the pipe, saddle side down. Align the alignment marks on the template with the center of the fusion joint.



Attach the two U-bolts around the pipe and through the template with the washers and nuts. Tighten the nuts until the pipe is held firmly in the template.





# Operation

## Drill Holes in the Pipe



**WARNING** Read and understand the all instructions provided with your drill and saw. Failure to follow all the drill and saw instructions, may result in electric shock, fire and/or serious personal injury.

With the drill bit provided, drill the four innermost large holes first then the remaining holes through the pipe wall.

Take particular care with the four inner holes to drill smoothly, ensuring a good surface finish.

**IMPORTANT:** On thick wall pipe, drill partially through the pipe then clear the shaving with a pair of needle nose pliers and then continue to drill through the pipe. This will prevent the drilling from over heating the pipe and melting the material or marring the surfaces of the reduced sections.

On small pipes, you may only be able to drill the 6 innermost holes.

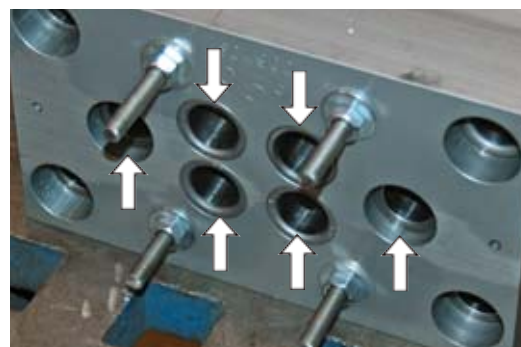
Remove the two wood screws or U-bolts and lift the template from the pipe. Clear the template of shaving and clear the pipe of any shaving.



PH04164-520-10



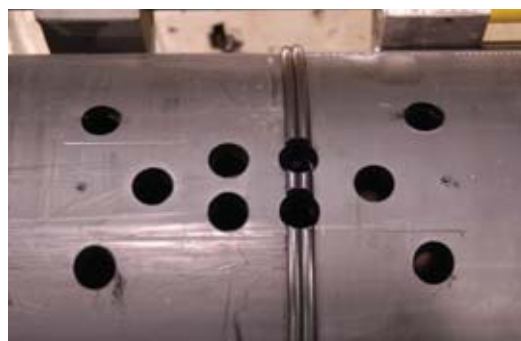
PH04165-520-10



PH04182-525-10



PH04161-520-10



PH04166-520-10



# Operation

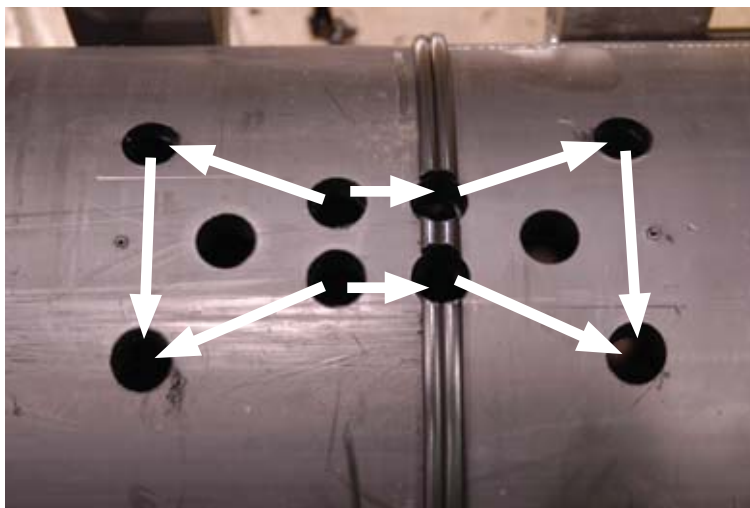
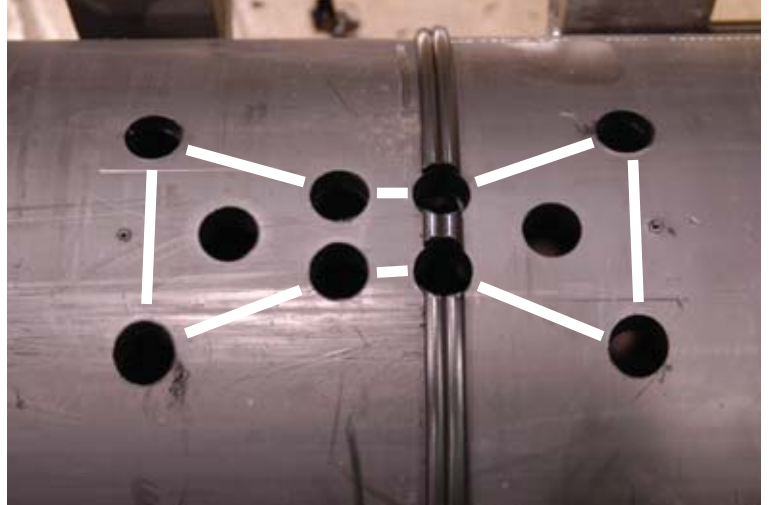
## Saw the Coupon

Mark the saw cuts to be made with a paint pen, grease pencil or other legible marking instrument.

### **⚠ WARNING**

Read and understand the all instructions provided with your drill and saw. Failure to follow all the drill and saw instructions, may result in electric shock, fire and/or serious personal injury.

Using a reciprocating saw, make saw cuts from the inner four holes out to the corners, then make the remaining cuts. Don't nick or gouge the narrow parts of the inner four holes.



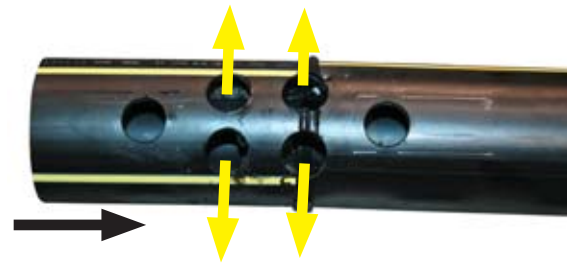
# Operation

## Saw the Coupon (cont'd)

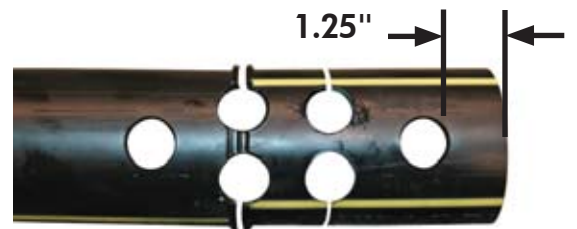
For smaller pipe, saw out the section of pipe and then saw the pipe in half long ways so that you have your holes all on one side of the cut pipe.

Saw cut one end of the pipe so that it is 1.25" away from the edge of the outer hole.

Make saw cuts on the inner holes from the inside out making sure to completely cut all the way through. This will allow the coupon to break in the inner reduced section only.



PH04183-5-25-10



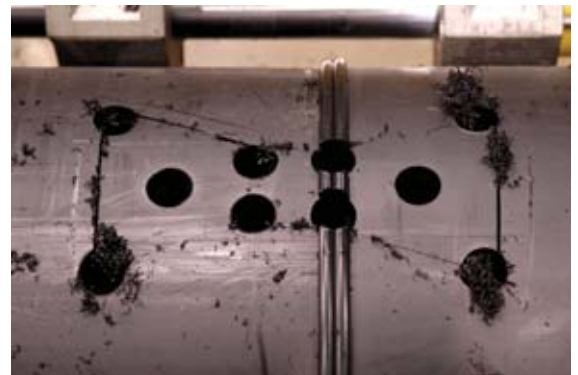
PH04179-5-25-10

TX04076-02-24-15

## Remove the Coupon

After all the saw cuts are made, the coupon is freed from the fused pipe.

Remove the coupon.



PH04170-5-20-10



PH04171-5-20-10

TX04077-5-25-10

# Operation

## Inspect the Coupon

Inspect the narrow sections of the coupon.

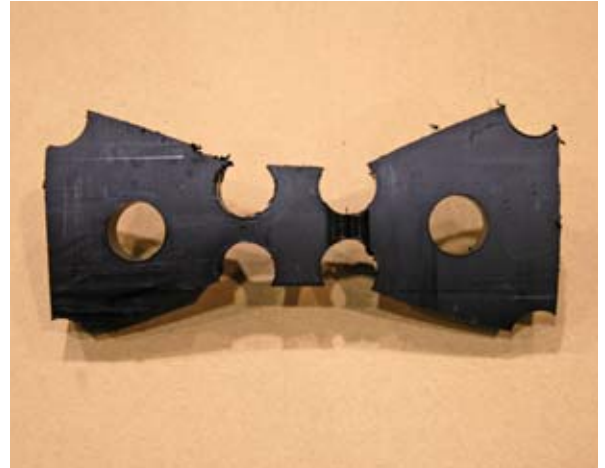
The surface finish on all four narrow section holes should be smooth.

Inspect for notches or gouges in the narrow section holes. Notches or gouges could effect the test results. If notches or gouges exist, cut another coupon from the pipe.

It may be helpful to measure the widths of the reduced sections of the coupon at the inner diameter and the outer diameter of the pipe with calipers, to ensure that the widths are in proper relationship to each other.

**NOTICE:** Ensure joint temperature and pipe temperature are the same. Failure to do so may result in a false failing result.

**NOTICE:** Temperature substantially affects the strength and ductility of polyethylene pipe. If results are confusing, condition samples carefully and retest.

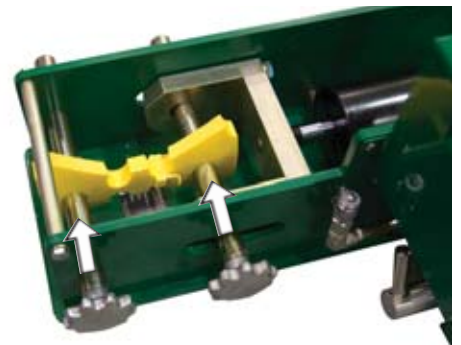


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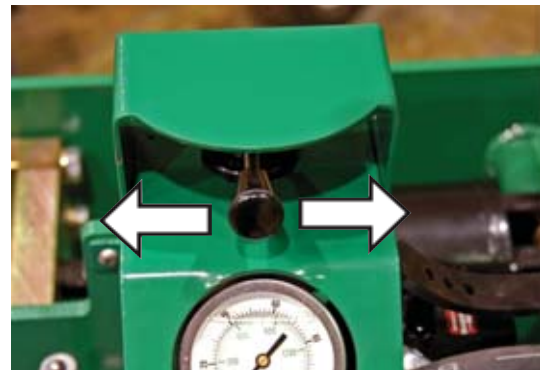
TX04078-02-24-15

## Mount the Coupon

After inspection is complete, load the coupon into the clevis and pins of the tensile tester. Use the pump to move the clevis to align the pins to the holes of the coupon.



PH04523-3-2-11



PH04155-5-20-10

TX04079-5-25-10

# Operation

## Perform Test

Move the directional valve to the right position.



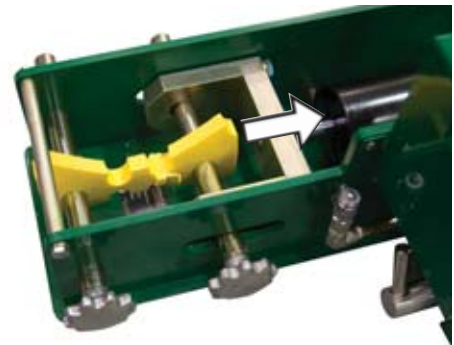
PH03982-7-14-09

Slowly pump the handle until the coupon breaks or until you reach the end of the cylinder stroke. The flow of the pump is limited in this direction to provide a slow tensile load to the coupon.

Remove the coupon.

**NOTICE:** The gauge does not provide significant information during a test and should be ignored.

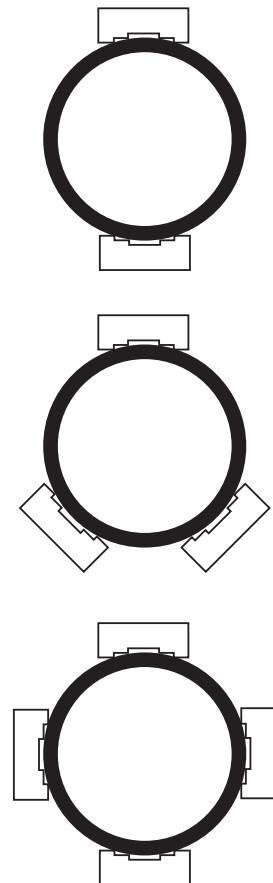
TX04080-1-31-11



PH04523-3-2-11

## Additional Coupons

Your quality control procedures may require additional coupons from the unused circumference of the same fusion joint. Move the template to the next required position on the joint and repeat the steps to produce a coupon.



CD00850-5-25-10

TX04090-5-25-10

# Operation

## Inspect Coupon/Interpret Result

- A)** The coupon breaks in the joint which is a failing result.
- B)** The coupon stretches in the pipe which is a passing result.
- C)** The coupon breaks in the pipe which is a passing result.

If the joint of the coupon does not pass, examine that you are doing everything properly and isolate the cause of the failing result.

### Areas to Examine

- **Testing Procedure**

- Was coupon to specifications?
- Were there scratches?
- Was surface smooth?
- Were widths correct?
- Were the pipe and joint temperatures the same?
- Was test performed at too cool a temperature?

- **Fusion Procedure**

- Is the fusion procedure you are using a qualified procedure?
- Are you following the procedure properly?
- Use a DataLogger™ with the fusion machine to verify the procedure is correct.

- **Adverse Conditions**

- Was the fusion joint made in an extreme ambient temperature situation?
- Was the fusion joint made in inclement weather (rain/snow etc)?
- Was the fusion joint made during excessive wind?

- **Joint Contamination**

- Did the ends of the pipe have contamination before the fusion took place?

- **Operator Qualification**

- Is the operator qualified to perform the procedure and visually inspect the resultant fusion?

- **Fusion Equipment**

- Is the equipment in good repair?
- Is the equipment clean?
- Does the equipment perform to specifications?

- **Proper Cool Time**

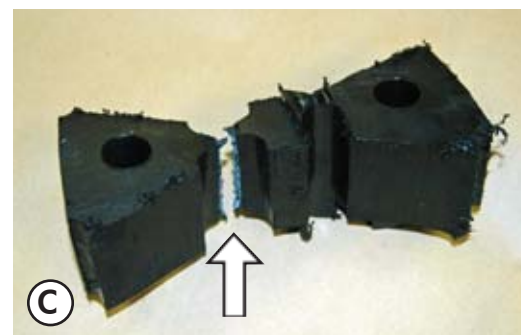
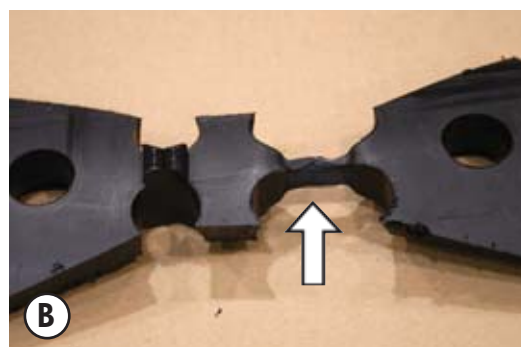
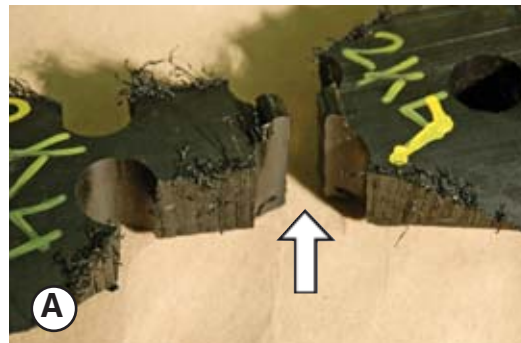
- Was the proper cooling time for the joint used?

- **Handling**

- Was the pipe with the fusion joint subjected to any rough handling?

- **Material**

- Is the material in accordance with the pipe manufacturers specifications?





# Maintenance

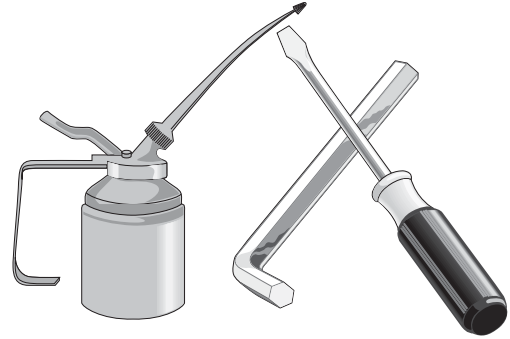
## Preventative Maintenance

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.

TX04082-5-25-10



CD00178-5-3-96

## Check Hydraulic Fluid

The hydraulic fluid level should be checked daily.

If the hydraulic oil is not half full from the top of the pump, oil must be added. Do not overfill.

If the pump and cylinders are empty, fill pump with oil and move the carriage left and right fully 3 times and check the fluid level and fill. Bleeding the hydraulic system is required when system has been empty. Refer to "Bleeding the Hydraulic System" section for instructions on bleeding the hydraulics.

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



PH04177-5-20-10

TX02973-4-15-09

# Maintenance

## Bleeding the Hydraulic System

Make sure the hydraulic pump fluid has been filled and tilt the machine 45 degrees so that the pump is facing up.

Pump the machine moving the cylinder in and out completely several times.

When bled, the machine should move immediately when pumped. Any pause may indicate that there is air still in hydraulic system. Repeat the pumping of the machine and then check the pump again.

If the cylinder moves immediately then there is no air left in the system.



PH04525-3-2:11

TX04086-5-25-10

## Fasteners Must Be Tight

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



PH04521-3-2:11

TX00437-9-13-94

# 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.



# Maintenance Checklist

## In Field Tensile Tester Machine Checklist

	OK
UNIT	
Machine is clean	
All pins are in place	
Machine is free of hydraulic leaks	
Directional Control Valve operates smoothly	
Hydraulic pump is filled to correct level	
All hardware is on the machine	
Hydraulic gauge reads correctly	
All nuts and bolts are tight	
Hydraulic pump handle is in place	

TX04083-5-25-10

# Specifications

## In Field Tensile Tester

### Specifications:

Designed to field test fusion joint coupons

- Qualitative testing of a joint in the field
- Can produce coupons from up to 5" thick pipe wall
- Template accommodates 2" IPS and larger pipe
- Hand pump system tests coupon

Max System Pressure: 1400 psi

Fluid Capacity: 1 pint

Drill Bit Diameter and Type: High Speed Steel 1" diameter with a 1/2" shank, 12" long with 9 inches of flute length.

Template Hole Size: 1"

### Dimensions:

Width: 15" (381 mm)

Length: 24" (610 mm)

Height: 22" (559 mm)

**Weight:** 105 lbs. (48 Kg) Tensile Tester

18 lbs. (8 Kg) Template

## 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.

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