

Operator's Manual



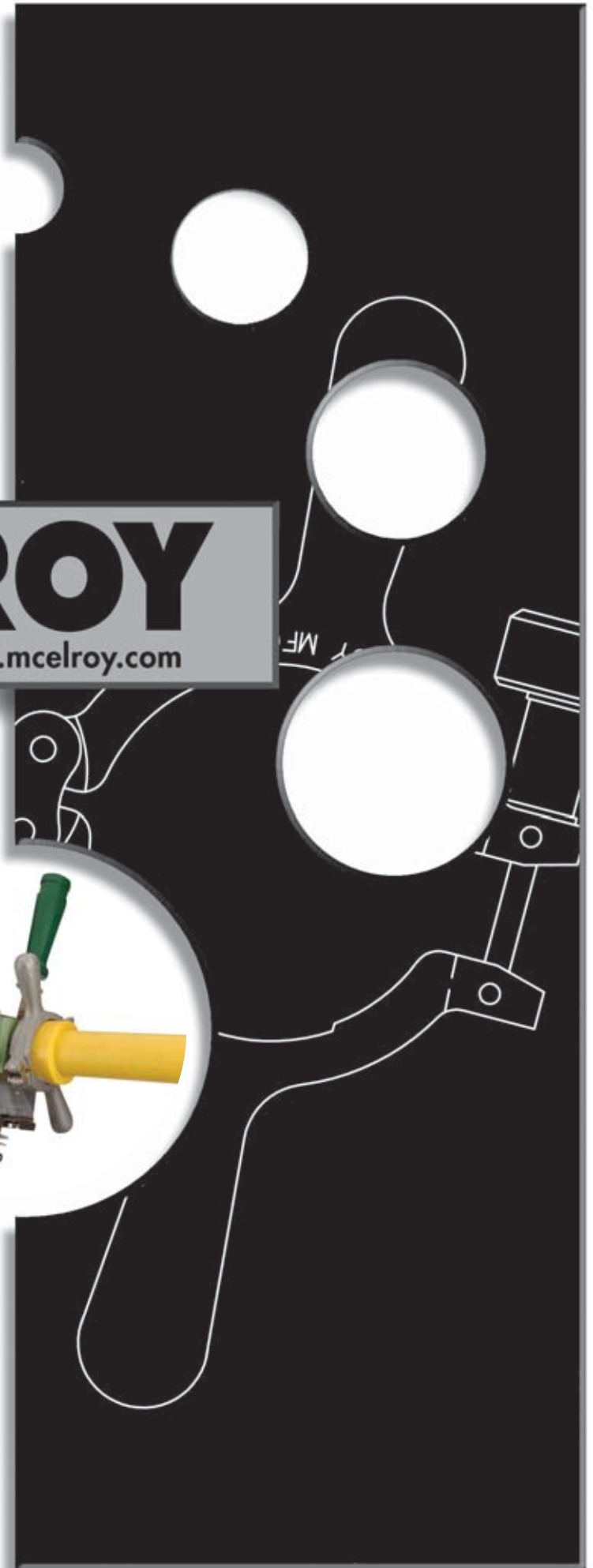
McELROY


www.mcelroy.com



Socket Fusion Tooling System

Original Language: English
Manual: SW00401 Revision: E 10/18



 **WARNING** Cancer and Reproductive Harm -
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

Introduction

Thank you for choosing McElroy

The McElroy Socket Fusion Tooling System is designed for socket fusion on 1/2" CTS to 4" IPS pipe. All system components comply with ASTM standards.

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.

TX01399-10-23-17



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



MU203-13-14

Warranty

ROY MFC

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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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.



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

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

 **CAUTION** 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.



WR00051-1-1-30-92

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.



SAFE1ST-1222-92

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, 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

⚠ DANGER

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.



WR00034-11-30-92

TX00100-04-28-14

Fusion Equipment Safety

Electrical Safety

⚠ WARNING

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.

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



WR00055-4-7-93



WR00025-11-30-92

TX02947-4-15-09

Heater is Hot

⚠ CAUTION

The heater is hot and will burn clothing and skin. Keep the heater in its insulated heater stand or blanket 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.



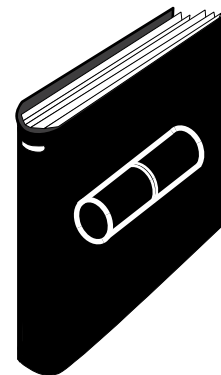
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TX00104-8-12-94

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.



WR00079-1-24-96

TX02984-5-22-12

Fusion Equipment Safety

Periodically Check Temperature

NOTICE: Incorrect heating temperature can result in bad fusion joints. Check heater plate surface temperature periodically with a properly calibrated pyrometer, and make necessary adjustments.

The thermometer on heaters indicates internal temperature, and should be used as a reference only.



TX00107-11-13-95

WR000774-16-93

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 polyethylene 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 polyethylene 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.



PH01194-6-24-97

The principal operations include:

- Clamping** The pipe and fitting must be held firmly to allow all subsequent operations to take place.
- Cleaning** The area of pipe that the fitting will come in contact with must be cleaned.
- Aligning** The fitting must be properly seated on the pipe for proper alignment.
- Heating** A melt pattern must be formed that penetrates into the pipe and into the fitting.
- Joining** The pipe and fitting must be joined and the pipe fully seated within the fitting.
- Holding** The molten joint must be held immobile 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
- ② Heater
- ③ Cold Ring Clamp
- ④ Heater Adapters
- ⑤ Chamfer Tool/Depth Gauge
- ⑥ Fitting Holder
- ⑦ Heater Handle
- ⑧ Pipe Cutter
- ⑨ Socket Fusion Toolbox



④

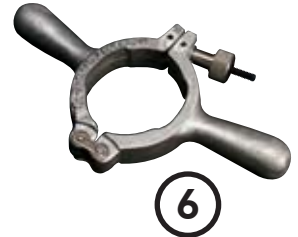
⑤



⑧



⑦



⑥

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Operation

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Prepare Pipe End

Cut off damaged or oval ends of pipe squarely with a pipe cutter.
Place the chamfering tool on end of pipe and turn to cut off sharp edge on top end of pipe.
Remove shavings and burrs inside pipe end.



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TX01400-6-20-97

Depth Gauge

The chamfering tool is also a depth gauge for measuring the length of pipe that will go into the fitting.
Place chamfering tool on end of pipe.
Place cold ring clamp on pipe at the bottom of the chamfering tool.
Remove chamfering tool.

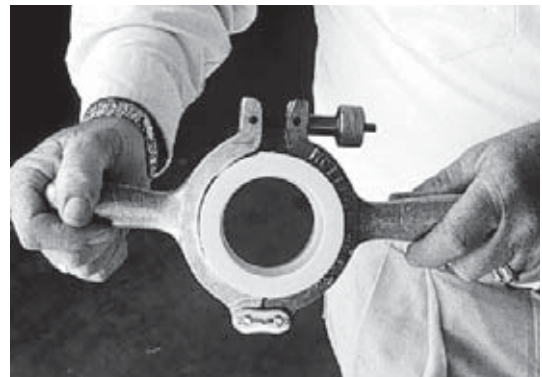


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TX01401-6-20-97

Secure 2" and Larger Fittings

Place fitting in socket fitting holder.
Tighten socket fitting holder around fitting.



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TX01402-6-20-97

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 with hands.



PH042026-11-10

TX01404-6-20-97

Heater Is Not Explosion Proof

⚠ DANGER

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 non-synthetic cloth to clean the heater adapter surfaces.



PH04211-6-14-10

TX01411-05-30-14

Heater Temperature

The socket faces of the heater must be at the temperature specified by the pipe manufacturer.

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



PH04203-6-11-10

TX01405-6-20-97

Heating The Pipe and Fitting

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

Place the female adapter of the heater over the end of the pipe, firmly against the cold ring clamp.

Heating time starts when the heater is bottomed out on the cold ring clamp.

Heat fitting and pipe for the pipe manufacturer's specified period of time.

NOTICE: Do not twist fitting, pipe or heater



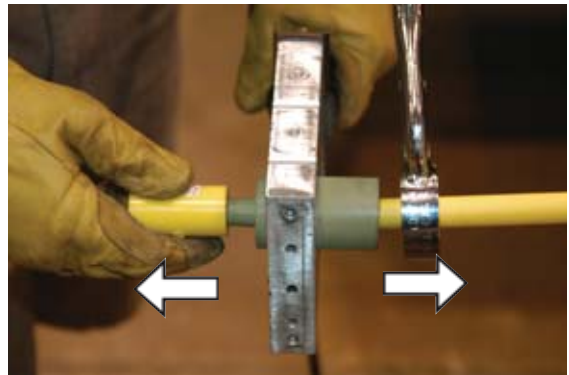
PH04204-6-11-10

TX01406-6-20-97

Remove Heater

Remove the pipe and the fitting from the heater.

TX01407-6-17-10



PH04205-6-11-10

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



PH04207-6-11-10

Fusion and Cooling

Within 3 seconds after the heater has been removed, firmly push the melted fitting squarely onto the pipe until it makes firm contact with the cold ring clamp.

NOTICE: Do not twist or rotate the fitting.

Hold the fitting firmly in place for the total cooling time specified by the pipe manufacturer to ensure proper alignment.

TX01409-6-20-97



PH04208-6-11-10

Inspecting Fusion Joint

After completing the pipe manufacturer's specified cooling time, remove the cold ring clamp and the socket fitting holder.

Inspect the joint. A good joint will have a uniform melt ring that is flat against the socket fitting and perpendicular to the pipe.

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

TX01410-6-20-97



PH04209-6-11-10

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.

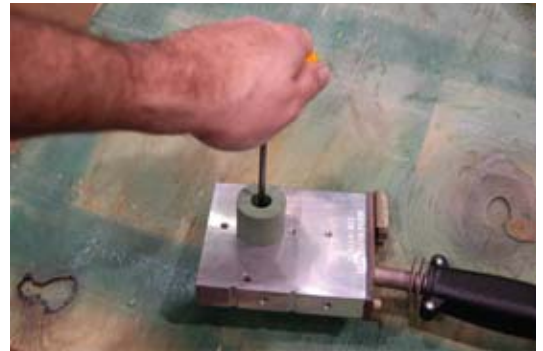
Care should be taken to assure that the heater adapters are seated on the heater body, and that there is no foreign matter trapped between these surfaces.

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.

TX01413-6-17-10



PH04199-6-11-10

Adjusting Heater Temperature

Turn knob to desired temperature. Measure the heater surface temperature with a pyrometer. Any variance must be corrected to the pyrometer reading.

Loosen setscrew in the knob. Turn knob to point to the same temperature as the pyrometer. Tighten setscrew in the knob.

Turn knob to desired temperature. Allow heater to stabilize at the new temperature (5 to 10 minutes) after adjusting.

The thermometer on the heater body indicates internal temperature and should be used as a reference only.

TX02009-3-13-02



PH02313-4-24-02

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.

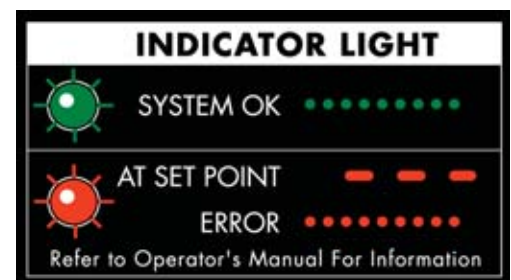
The heater has a red indicator light on the handle at the bottom of the temperature scale. When the heater is plugged in and preheating the red light glows steadily until the set temperature is reached. The red light then goes off and on as the heater maintains temperature.

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.

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PH02314-4-24-02



PH02571-09-16-03

Specifications

Specifications

The McElroy Socket Fusion Tooling System is designed for socket fusion on 1/2" CTS to 4" IPS pipe. All system components comply with ASTM standards.

Heaters:

2" Heater Power - 100V - 120V, 50/60Hz, 800 Watt, 1Ph

2" Heater Power - 200V - 240V, 50/60Hz, 800 Watt, 1Ph

4" Heater Power - 100V - 120V, 50/60Hz, 1200 Watt, 1Ph

4" Heater Power - 200V - 240V, 50/60Hz, 1200 Watt, 1Ph

Weight:

2" Heater: 6 lbs.

4" Heater: 7 lbs.

Toolbox Dimensions:

Length: 24"

Width: 10"

Height: 9.5"

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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