WARNING

Failure to follow instructions and warnings could result in serious personal injury, property damage, and/or product damage.

- Before operating or servicing the VG824 or VG828 Cut Grooving Tool, read all instructions in this manual and all warning labels on the tool.
- Wear safety glasses, hardhat, foot protection, and hearing protection while working around this tool.
- Save this operating and maintenance manual.

If you need additional copies of any literature, or if you have questions concerning the safe and proper operation of this tool, contact Victaulic, P.O. Box 31, Easton, PA 18044-0031, Phone: 1-800-PICK VIC, E-Mail: pickvic@victaulic.com.
HAZARD IDENTIFICATION

Definitions for identifying the various hazard levels are provided below.

This safety alert symbol indicates important safety messages. When you see this symbol, be alert to the possibility of personal injury. Carefully read and fully understand the message that follows.

DANGER

- The use of the word “DANGER” identifies an immediate hazard with a likelihood of death or serious personal injury if instructions, including recommended precautions, are not followed.

WARNING

- The use of the word “WARNING” identifies the presence of hazards or unsafe practices that could result in death or serious personal injury if instructions, including recommended precautions, are not followed.

CAUTION

- The use of the word “CAUTION” identifies possible hazards or unsafe practices that could result in personal injury and product or property damage if instructions, including recommended precautions, are not followed.

NOTICE

- The use of the word “NOTICE” identifies special instructions that are important but not related to hazards.

OPERATOR SAFETY INSTRUCTIONS

VG824 and VG828 Cut-Grooving Tools are designed only for cut grooving pipe. Use of these tools requires dexterity and mechanical skills, as well as sound safety habits. Although these tools are designed for safe, dependable operation, it is impossible to anticipate all combinations of circumstances that could result in an accident. The following instructions are recommended for safe operation of these tools. The operator is cautioned always to practice “safety first” during each phase of use, including setup and maintenance. It is the responsibility of the owner, lessee, or user to ensure that all operators read this manual and fully understand the operation of these tools.

Read this operating and maintenance instructions manual and the operating and maintenance instructions manual for the Victaulic Power Mule II or power drive before operating or servicing these tools. Become familiar with the tools' operations, applications, and limitations. Be particularly aware of their specific hazards. Store this manual in a clean area where it is always readily available. Additional copies of this manual are available upon request through Victaulic.

1. These tools are designed ONLY for cut grooving pipe sizes, materials, and wall thicknesses listed in this manual.
2. Avoid using tools in dangerous environments. Do not expose tools to rain, and do not use tools in damp or wet locations. Do not use tools on sloped or uneven surfaces. Keep the work area well lit. Allow sufficient space to operate tools properly.
3. Prevent back injury. Use proper lifting techniques when handling heavy tool components.
4. Inspect the equipment. Before using any tools, check all moveable parts for any obstructions. Make sure tool components are installed and adjusted properly.
5. **Prevent accidental startups.** Always unplug the Victaulic Power Mule II or power drive from the electrical source. The rotation control switch of the Victaulic Power Mule II **DOES NOT** feature a “neutral” or “off” position. Depressing the safety foot switch will energize the tool immediately if it is not unplugged. **ALWAYS USE THE SAFETY FOOT SWITCH TO OPERATE THE VICTAULIC POWER MULE II OR POWER DRIVE.**

6. **Wear proper apparel.** Do not wear loose clothing, jewelry, or anything that can become entangled in moving parts.

7. **Wear protective items when working with tools.** Always wear safety glasses, hardhat, foot protection, and hearing protection.

8. **Stay alert.** Do not operate the tool if you are drowsy from medication or fatigue. Avoid horseplay around the equipment.

9. **Keep visitors away from the immediate work area.** All visitors should be kept a safe distance from equipment at all times.

10. **Keep work areas clean.** Keep the work area around the tool clear of any obstructions that could limit the movement of the operator. Clean up any metal shavings and oil or other spills.

11. **Secure the work, tool, and accessories.**

12. **Support the work.** Support the pipe in a pipe vise that is mounted to a workbench or a stand. The workbench or stand must be secured to the floor.

13. **OPERATE THE VICTAULIC POWER MULE II ON THE HANDLE SIDE ONLY.** The Victaulic Power Mule II must be operated with a safety foot switch that is located for easy operator access. Never reach across moving parts. If the Victaulic Power Mule II or power drive does not contain a safety foot switch, contact Victaulic.

14. **Align the Victaulic Power Mule II with the cut-groover’s drive shaft.** Always position the Victaulic Power Mule II 90° to the cut groover’s drive shaft. Make sure there is no binding between the drive head of the Victaulic Power Mule II and the drive shaft of the cut groover.

15. **Keep hands and tools away from the pipe, cut-grooving tool, Victaulic Power Mule II/ power drive during operation.**

16. **Do not reach inside the pipe end during tool operation.**

17. **Do not over-reach.** Maintain proper footing and balance at all times. Make sure the safety foot switch is easily accessible for the operator.

18. **Do not force the tool.** Do not force the tool or accessories to perform any functions beyond their capabilities. Do not overload the tool.

19. **Do not abuse the safety foot switch cord.** Never yank the cord out of the receptacle. Keep the cord away from heat, oil, and sharp objects.

20. **Always unplug the Victaulic Power Mule II or power drive from the electrical source before servicing or adjusting the tool.** Only authorized personnel should attempt to perform maintenance on the tool.

21. **Maintain tools with care.** Keep tools clean at all times to ensure proper and safe performance. Follow all maintenance instructions.

22. **Store tools in a dry, secure place when not in use.**

23. **Use only Victaulic replacement parts and accessories.** Use of any other parts may result in a voided warranty, improper operation, and hazardous situations.

24. **Do not remove any labels from the tool.** Replace any damaged or worn labels.
INTRODUCTION

NOTICE

- Drawings and/or pictures in this manual may be exaggerated for clarity.
- The tool, along with this operating and maintenance instructions manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.

Victaulic VG824 Cut-Grooving Tools are designed for cut grooving 8 – 24-inch IPS carbon steel and AWWA size cast or ductile iron pipe. Wall thickness capacity for the VG824 is 0.238 – 0.750 inch (thicknesses include any linings).

Victaulic VG828 Cut-Grooving Tools for Advanced Groove System™ specifications are designed for cut grooving 14 – 24-inch carbon steel pipe only. The minimum pipe wall thickness requirement for the VG828 is “XS” (Extra Strong, 0.500 inch/12.7 mm). The maximum pipe wall thickness capacity of the VG828 is 0.750 inch/19.1 mm.

During operation, the tool grips the pipe wall between two external support rolls and an internal drive roll. The tool travels around the pipe circumference in a clockwise direction. While being driven in a clockwise direction, the tool pulls itself tightly against the pipe end. The tool bit, which cuts the groove into the pipe, is spring-loaded against the pipe and removes material until the depth stop, mounted directly adjacent to the tool bit, contact the pipe surface. The pipe stop, mounted in the same arm as the tool bit, prevents the tool bit from cutting further into the pipe and ensures uniform groove depth.

TOOL BIT INFORMATION FOR VG824 TOOLS

Standard, high-speed tool bits for VG824 tools are designed with two cutting edges (with the exception of tool bits for 22 – 24-inch sizes) to provide long tool bit life. These tool bits are re-sharpenable.

VG824 tool bits for grooving iron pipe (gray or ductile) are a single-edge, carbide-tipped design. This design is not suitable for re-sharpening. Refer to the “VG824 Tool Bit/pipe stop specifications” table for further information.

TOOL BIT INFORMATION FOR VG828 TOOLS

VG828 tool bits for cut grooving to AGS specifications are high-speed steel and ARE NOT suitable for re-sharpening. Contact Victaulic for replacement tool bits. Refer to the “VG828 Tool Bit/pipe stop specifications” table for further information.

CAUTION

- VG824 and VG828 tools are designed ONLY for cut grooving pipe sizes, materials, and wall thicknesses listed in this manual.

Failure to follow this instruction could overload the tool, resulting in reduced tool life and/or damage to the tool.

WARNING

- DO NOT attempt to re-sharpen VG828 tool bits for cut grooving to Advanced Groove System (AGS) specifications.

- Use of re-sharpened tool bits for cut grooving to AGS specifications may produce improper groove profiles.

Failure to follow these instructions may cause improper product installation and product failure, resulting serious personal injury and/or property damage.
RECEIVING THE VG824 AND VG828 TOOLS

VG824 and VG828 tools are packed in wooden chests that are designed for repeated shipping. Save the original chest for return shipment of rental tools.

Upon receipt of the tool, make sure all necessary parts are included. If any parts are missing, contact Victaulic.

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* Factory Settings for the VG824 Tool
VG824 tool are set at the factory prior to shipment for trial grooving of 10-inch IPS steel pipe, unless specified otherwise on the order. If the VG824 tool is ordered for other types of pipe, sizes, and styles of groove, the tool will be set at the factory, as ordered. NOTE: Additional lead time is required for For grooving to specifications other than those set “as shipped,” follow all sections in this manual to ensure proper tool setup. VG824 tools ordered for cut grooving to other than standard IPS specifications are provided set, as ordered, with the correct tool bit and pipe stops mounted on the tool. In addition, one extra tool bit of the same type is supplied. EXAMPLE: A tool ordered for 10 – 12-inch cast iron rigid grooving would be supplied with one 10 – 12-inch CIR bit mounted in the tool and one extra 10 – 12-inch CIR tool bit supplied loose.

A 0.562-inch width groove is required for 22 – 24-inch pipe sizes in order to obtain the maximum allowable pipe end movement. The 0.500-inch groove width will provide half the maximum allowance for 22 – 24-inch pipe sizes. For the 8-inch pipe size, the 0.500 groove width does not change the allowable pipe-end movement.

‡ Factory Settings for the VG828 Tool
VG828 Tool are shipped from the factory for grooving 14 – 24-inch pipe to AGS specifications. The VG828 is intended ONLY for cut grooving pipe to AGS specifications.
ADDITIONAL TOOLS THAT MAY BE REQUIRED FOR TOOL SETUP, ADJUSTMENT, OR OPERATION

The following is a list of items that are not included in the shipment but may be required during tool setup, adjustment, or operation.

SPEED REDUCTION CONTROL

Victaulic recommends a speed reduction control unit (115-volt, 15-amp AC) for various universal power drive sources to provide proper grooving tool rotation speed. The speed reduction control plugs in between the electrical supply and the power drive’s electrical plug. **NOTE:** A speed reduction control is not required when the Victaulic Power Mule II is used as the power drive. DO NOT use a speed reduction control with induction-type motors.

CHAIN-TYPE PIPE VISE AND VISE STAND

OILER

CRESCENT WRENCH

MACHINIST’S END RULE

SLOTTED SCREWDRIVER (THIN)

3/8-INCH COMBINATION WRENCH

5/16-INCH COMBINATION WRENCH

9/16-INCH COMBINATION WRENCH

9/16-INCH COMBINATION WRENCH

TM-VG824/VG828 OPERATING AND MAINTENANCE INSTRUCTIONS MANUAL

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REV_A

TM-VG824/VG828_5
POWER REQUIREMENTS FOR
THE VICTAULIC POWER MULE II
OR POWER DRIVE

DANGER

- To reduce the risk of electric shock, check the electrical source for proper grounding.
- Before performing any maintenance on the Power Mule II or power drive, disconnect the power cord from the electrical source.

Failure to follow these instructions could result in death or serious personal injury.

The VG824 and VG828 tools are designed for use with the Victaulic Power Mule II and power drives in conjunction with a secure pipe support system. Power, speed, and safety requirements must be verified before attempting to use any power source other than the Victaulic Power Mule II. All power sources must be equipped with a safety foot switch for safe and proper operation. If the power source is shipped without a safety foot switch, contact the manufacturer.

The Victaulic Power Mule II is designed to operate on a 115-volt, 20-Amp, 25 – 60 Hz, single-phase power supply. In addition, a 220-volt, 8-Amp model is available.

Most other power drives are designed to operate on a 115-volt, 15-Amp, 50/60-Hz power supply or 220-volt, 8-Amp, 50/60-Hz power supply.

Always refer to the operating and maintenance instructions for the Victaulic Power Mule II or the applicable power drive for detailed information.

VG824 and VG828 tools must be driven at 32 revolutions per minute (RPM) or less (under load). If the power source runs too fast, tool bit chatter may occur. Use of a speed reduction controller is recommended to reduce the speed of the power source.

TM-VG824/VG828_6
**TOOL NOMENCLATURE**

**NOTICE**

- Drawings and/or pictures in this manual may be exaggerated for clarity.
- The tool, along with this operating and maintenance instructions manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.

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**WARNING**

- For cut grooving to Victaulic AGS specifications, the minimum pipe wall thickness requirement is "XS" (Extra Strong, 0.500 inch/12.7 mm).
- The maximum pipe wall thickness capacity of this tool is 0.750 inch/19.1 mm.
- Failure to follow this instruction could cause joint separation, resulting in serious personal injury and/or property damage.

---

**Cutting Side**

- Top Pipe Stop Bolts
- Bottom Pipe Stop Bolts
- 1\(\frac{1}{4}\)-inch Square Drive
- Top Pipe Stop
- Bottom Pipe Stop
- Tool Bit
- Tool Bit Set Screw
- screw Jam
- Depth Stop
- External Support Roll
- External Support Roll Lubricant Port
- External Support Roll Feed Nut
- Tool Bit Feed Knob
- Drive Roll
- Drive Gear Box
- Handle
- Leaf Spring
- Adjustment
- Assembly
- Center Adjustable Pipe Stop
- Depth Stop Adjustment Access Port
- Tool Bit Removal Access Port
- Center Pipe Stop Lock Screw
- Bottom Pipe Stop

---

**Bottom View**

- Drive Gear Box
- Center Adjustable Pipe Stop
- Center Pipe Stop Lock Screw
- Leaf Spring
- Handle
- Tool Bit Removal Access Port
- Depth Stop Adjustment Access Port

---

**Bottom Pipe Stop Bolts**

- Top Pipe Stop Bolts
- Bottom Pipe Stop Bolts

---

**Drive Side**

- Top Pipe Stop
- Bottom Pipe Stop
- Tool Bit
- Tool Bit Set Screw
- screw Jam
- Depth Stop
- External Support Roll
- External Support Roll Lubricant Port
- External Support Roll Feed Nut
- Tool Bit Feed Knob
- Drive Roll
- Drive Gear Box
- Handle
- Leaf Spring
- Adjustment
- Assembly
- Center Adjustable Pipe Stop
- Depth Stop Adjustment Access Port
- Tool Bit Removal Access Port
- Center Pipe Stop Lock Screw
- Bottom Pipe Stop

---

**WARNING**

- For cut grooving to Victaulic AGS specifications, the minimum pipe wall thickness requirement is "XS" (Extra Strong, 0.500 inch/12.7 mm).
- The maximum pipe wall thickness capacity of this tool is 0.750 inch/19.1 mm.
- Failure to follow this instruction could cause joint separation, resulting in serious personal injury and/or property damage.

---

**Cutting Side**

- Top Pipe Stop Bolts
- Bottom Pipe Stop Bolts
- 1\(\frac{1}{4}\)-inch Square Drive
- Top Pipe Stop
- Bottom Pipe Stop
- Tool Bit
- Tool Bit Set Screw
- screw Jam
- Depth Stop
- External Support Roll
- External Support Roll Lubricant Port
- External Support Roll Feed Nut
- Tool Bit Feed Knob
- Drive Roll
- Drive Gear Box
- Handle
- Leaf Spring
- Adjustment
- Assembly
- Center Adjustable Pipe Stop
- Depth Stop Adjustment Access Port
- Tool Bit Removal Access Port
- Center Pipe Stop Lock Screw
- Bottom Pipe Stop

---

**Bottom View**

- Drive Gear Box
- Center Adjustable Pipe Stop
- Center Pipe Stop Lock Screw
- Leaf Spring
- Handle
- Tool Bit Removal Access Port
- Depth Stop Adjustment Access Port

---

**WARNING**

- For cut grooving to Victaulic AGS specifications, the minimum pipe wall thickness requirement is "XS" (Extra Strong, 0.500 inch/12.7 mm).
- The maximum pipe wall thickness capacity of this tool is 0.750 inch/19.1 mm.
- Failure to follow this instruction could cause joint separation, resulting in serious personal injury and/or property damage.

---

**Cutting Side**

- Top Pipe Stop Bolts
- Bottom Pipe Stop Bolts
- 1\(\frac{1}{4}\)-inch Square Drive
- Top Pipe Stop
- Bottom Pipe Stop
- Tool Bit
- Tool Bit Set Screw
- screw Jam
- Depth Stop
- External Support Roll
- External Support Roll Lubricant Port
- External Support Roll Feed Nut
- Tool Bit Feed Knob
- Drive Roll
- Drive Gear Box
- Handle
- Leaf Spring
- Adjustment
- Assembly
- Center Adjustable Pipe Stop
- Depth Stop Adjustment Access Port
- Tool Bit Removal Access Port
- Center Pipe Stop Lock Screw
- Bottom Pipe Stop

---

**Bottom View**

- Drive Gear Box
- Center Adjustable Pipe Stop
- Center Pipe Stop Lock Screw
- Leaf Spring
- Handle
- Tool Bit Removal Access Port
- Depth Stop Adjustment Access Port
CHAIN-TYPE PIPE VISE SETUP

**CAUTION**

- The stand or workbench must be secured to the floor, and the chain-type pipe vise must be secured to the stand or workbench.

Failure to follow this instruction could result in personal injury and product damage.

1. The VG824 and VG828 Cut Grooving Tools are designed for field or shop use. Select a location for the grooving operation by taking into consideration the following factors:
   1a. The required power supply (refer to the operating instructions for the Victaulic Power Mule II or the applicable power drive)
   1b. Adequate space to handle pipe lengths
   1c. A firm and level surface for tool operation
   1d. Anchoring requirements for the power drive (if applicable) and pipe vise
2. Fasten a stand or workbench securely to the floor.
3. Mount a chain-type pipe vise to the secured stand or workbench. The chain-type pipe vise must be capable of supporting the weight of the pipe and tool (tool weighs approximately 82 – 85 pounds). The chain-type pipe vise should be flush with or slightly overhang the edge of the stand or workbench to permit the tool to rotate freely without being obstructed.

PREPARING PIPE FOR GROOVING

For proper tool operation and production of grooves that are within Victaulic specifications, the following pipe preparation steps must be followed.

Victaulic recommends square-cut pipe for use with grooved-end pipe products. Square-cut pipe MUST be used with Victaulic FlushSeal® and EndSeal® gaskets.

Victaulic VG824 Cut-Grooving Tools are designed for cut grooving 8 – 24-inch IPS and AWWA size case or ductile iron pipe. Wall thickness capacity for the VG824 is 0.238 – 0.750 inch (thicknesses include any linings). For pipe sizes grooved to original specifications with the VG824 tool, raised internal and external weld beads and seams must be ground flush with the pipe surface 3½ inches/89 mm back from the pipe ends.

**CAUTION**

- DO NOT attempt to groove standard-wall or lighter-wall pipe with the VG828 tool for AGS specifications.

Failure to follow this instruction will cause the pipe wall to be too thin at the groove, resulting in improper joint performance.

Victaulic VG828 Cut-Grooving Tools for AGS specifications are designed for cut grooving 14 – 24-inch carbon steel pipe only. The minimum pipe wall thickness requirement for the VG828 is “XS” (Extra Strong, 0.500 inch/12.7 mm). The maximum pipe wall thickness capacity of the VG828 is 0.750 inch/19.1 mm. For 14 – 24-inch/355.6 - 610.0-mm pipe grooved to AGS specifications with the VG828 tool, raised internal and external weld beads and seams must be ground flush with the pipe surface 4 inches/100 mm back from the pipe ends.
VG828 tools are shipped with an “AGS 14-24 Pipe Wall No-Go Gauge” that should be used to determine if the pipe wall thickness meets the requirements for cut grooving to AGS specifications. If the pipe wall thickness fits between the two pegs of the gauge, the wall thickness is too thin and the pipe must not be used for cut grooving to AGS specifications. If the pipe wall thickness does not fit between the two pegs of the gauge, the pipe can be used for cut grooving to AGS specifications, up to a maximum wall thickness of 0.750 inch/19.1 mm using the VG828 tool.

**CAUTION**

- Foreign material and loose rust must be removed from the interior and exterior surfaces of the pipe ends.

Foreign material may interfere with or damage the drive roll, resulting in improper tool operation.

All coarse scale, dirt, and other foreign material must be removed from the interior and exterior surfaces of the pipe ends.

**PIPE LENGTH REQUIREMENTS**

The minimum pipe length that can be grooved with VG824 or VG828 tools is 18 inches/457 mm.

1. Make sure all instructions in the “Chain-Type Pipe Vise Setup” section have been followed.

2. Position the pipe to overhang the pipe vise approximately 6 – 12 inches/152 – 305 mm so that the tool can groove the pipe without being obstructed by the pipe vise, pipe vise stand, or workbench.
CHECKING AND ADJUSTING THE TOOL PRIOR TO GROOVING

1. Make sure the proper tool bit is installed for the pipe size and type of grooving required. Refer to the applicable “Tool Bit/Pipe Stop Specifications” table. If the incorrect tool bit is installed, refer to the “Tool Bit Removal” and “Tool Bit Installation” sections.

2. Make sure the proper pipe stops are installed for the pipe size and type of grooving required. Refer to the applicable “Tool Bit/Pipe Stop Specifications” table. If the incorrect pipe stops are installed, refer to the “Pipe Stop Removal and Installation” section.

MOUNTING THE VG824 OR VG828 TOOL ONTO THE PIPE

1. Before mounting the tool onto the pipe, retract the tool bit feed knob (A) fully by turning counterclockwise. Retract the external support rolls fully by turning the external support roll feed nut (B) counterclockwise.

2. Lift the tool and mount it onto the pipe end. The tool bit feed knob should be facing downward, and the drive roll should be inside the pipe. Use caution to prevent the tool bit from hitting the pipe during mounting.

3. Hold the tool firmly against the pipe end, making sure the pipe stops are in complete contact with the pipe end. Tighten the external support roll feed nut by turning clockwise to bring the external support rolls into contact with the outside pipe surface. Load the external support rolls against the pipe by turning the external support roll feed nut with a 15-inch crescent wrench, as shown. Tighten the external support roll feed nut to approximately 75 – 85 ft-lbs.

NOTICE

- DO NOT over-tighten the external support rolls, since damage to the pipe and/or the tool may result. This is extremely important when the VG824 tool is used on gray cast iron pipe or glass-lined pipe, since these materials are brittle and may crack under too much compression.
- If the external support rolls are not tightened sufficiently, the tool may not “track” properly, resulting in improper grooves.
ATTACHING THE VICTAULIC POWER MULE II TO THE VG824 OR VG828 TOOL

**WARNING**

- Make sure the Power Mule II is disconnected from the electrical source before attempting to attach the VG824 or VG828 tool.
- DO NOT connect the Power Mule II to the electrical source until instructed otherwise.

Failure to follow this instruction could result in serious personal injury.

1. Insert the square drive adapter into the power head of the Victaulic Power Mule II.

2. Align the square drive adapter with the 15/16-inch square drive on the tool. Slide the power head of the Power Mule II onto the square drive of the tool, as shown. Make sure the Power Mule II is positioned 90° to the pipe centerline. Refer to the drawings below.

3. Tighten the two set screws on the square drive adapter of the Power Mule II.
4. The tool is set up and ready for grooving. Refer to the “Grooving Operation” section.

ATTACHING A POWER DRIVE TO THE VG824 OR VG828 TOOL

**WARNING**

- Make sure the power drive is disconnected from the electrical source before attempting to attach the VG824 or VG828 tool.
- DO NOT connect the power drive to the electrical source until instructed otherwise.

Failure to follow this instruction could result in serious personal injury.

This procedure applies to a power drive that utilizes a universal drive shaft to attach to the VG824 or VG828 tools.

1. Mount the power drive securely to a power drive stand.
2. Position the power drive/stand so that the centerline of the power drive chuck aligns with the pipe centerline both horizontally and vertically. Refer to the drawings on this page. The power drive/stand must be located far enough away from the pipe so that the universal drive shaft will fit properly between the power drive/stand and VG824 or VG828.
3. Mount the chuck end of the universal drive shaft into the power drive chuck. Tighten the chuck securely.
4. Collapse the universal drive shaft far enough to fit the square hole end (tool end) of the shaft onto the 15/16-inch square drive of the VG824 or VG828 tool. Slide the end of the universal drive shaft over the 15/16-inch square drive of the VG824 or VG828 tool. Tighten the set screw of the universal drive shaft securely. Make sure the universal drive shaft is not extended further than the power drive manufacturer’s recommendations. Always refer to the power drive manufacturer’s operating and maintenance manual for detailed information and lubrication requirements.
5. Fasten the power drive stand securely to the floor before attempting to perform the grooving operation.
6. The tool is set up and ready for grooving. Refer to the “Grooving Operation” section.
GROOVING OPERATION

Always refer to the operating and maintenance instructions for the Victaulic Power Mule II or the applicable power drive for detailed operating information.

1. Plug the safety foot switch cord of the Power Mule II or power drive into an internally-grounded electrical outlet. Refer to the “Power Requirements for the Victaulic Power Mule II or Power Drive” section. If an extension cord is used, refer to the “Extension Cord Requirements” section. If a speed control reducer is being utilized, plug the speed control reducer into an internally-grounded electrical outlet, and plug the safety foot switch for the Power Mule II or power drive into the speed control reducer.

**WARNING**

- Never attempt to operate the tool in the counterclockwise direction.

Failure to follow this instruction may cause the tool to come off the pipe end, resulting in serious personal injury and/or product damage.

For grooving operations utilizing a Victaulic Power Mule II: Set the rotation control switch to the FORWARD position. VG824 and VG828 tools are designed to operate in a CLOCKWISE direction when viewed from the 15/16-inch square drive shaft side of the tool.

2. Check tool rotation by depressing the safety foot switch momentarily. Proper rotation direction of the tool must be CLOCKWISE when viewed from the 15/16-inch square drive shaft side of the tool.

3. If tool rotation direction is clockwise, proceed to step 4.

3a. If tool rotation direction is counterclockwise, flip the control switch on the Power Mule II or power drive to the opposite direction. Re-test tool rotation direction, and make sure the tool rotates CLOCKWISE. If problems persist, contact Victaulic.

4. Depress the safety foot switch to drive the tool in the CLOCKWISE direction for several revolutions. Observe the stability of the tool. The tool should rotate around the pipe smoothly without slipping when approaching the top of the pipe or dropping when approaching the bottom of the pipe. If the tool does not rotate smoothly, remove foot from the safety foot switch, and tighten the external support roll feed nut an additional 1/8 turn. Re-test tool for stability, and tighten the external support roll feed nut in 1/8-turn increments, as needed.

**NOTICE**

- DO NOT over-tighten the external support rolls, since damage to the pipe and/or the tool may result. This is extremely important when the VG824 tool is used on gray cast iron pipe or glass-lined pipe, since these materials are brittle and may crack under too much compression.

5. Prepare a trial groove by depressing the safety foot switch to drive the tool in the CLOCKWISE direction.
6. As the tool rotates, generously oil the area where the groove will be cut, as shown above. Use a good-grade cutting oil (i.e. Ridgid* dark thread cutting oil or equivalent) on steel pipe only. For aluminum or stainless steel pipe, use a thread cutting oil that is formulated specifically for these materials. **DO NOT apply oil on cast iron (gray or ductile) pipe.**

7. Turn the tool bit feed knob gradually in the **CLOCKWISE** direction to advance the tool bit against the pipe while the tool is rotating.

7a. The tool bit is advanced properly when the leaf spring is approximately \( \frac{3}{8} \) inch open from the stop nut on the leaf spring adjustment post. Using the hand knob, continue advancing the tool bit in \( \frac{1}{4} \)-turn increments every three or four rotations of the pipe to maintain the proper spacing, as shown above.

**CAUTION**

- An opening **MUST** be maintained between the stop nut on the leaf spring adjustment post and the leaf spring.

If the hand knob is turned enough to eliminate this opening, the tool bit will cut a chip that is too large, which may jam the tool, overload the power drive, and/or shear the serrated drive roll key.

8. Continue grooving and oiling the pipe until the groove is complete. The groove is complete when the tool bit stops removing material around the entire circumference of the pipe. Indications of a complete groove or a nearly complete groove are:

8a. Oil remaining in the bottom of the groove after the tool bit passes

8b. The Power Mule II or power drive picks up speed

8c. Chips stop falling to the floor

8d. The groove depth stop lightly contacts the pipe directly behind the groove
9. Follow the instructions in the “Preparing to Dismount the VG824 or VG828 Tool” section on this page and the applicable “Dismounting” section on the following page.

10a. If the groove diameter (“C” dimension) is not within Victaulic specifications, the diameter stop must be adjusted. Refer to the “Groove Diameter Adjustment” section.

11. Prepare another trial groove, and check the groove diameter (“C” dimension), as described in step 10 on this page. Repeat these steps, as necessary, until the groove diameter is within specification.

PREPARING TO DISMOUNT THE VG824 OR VG828 TOOL

1. Stop the tool at the top side of the pipe with the tool bit feed knob facing upward.
2. Retract the tool bit completely by turning the tool bit feed knob counterclockwise.
3. Drive the tool clockwise. Stop the tool at the bottom of the pipe with the tool bit feed knob facing downward.
DISMOUNTING THE VG824 OR VG828 TOOL WHEN USED WITH THE VICTUALIC POWER MULE II

1. Loosen the two set screws that are located at the square drive adapter.
2. Flip the rotation control switch on the Victaulic Power Mule II to the opposite position.
3. Momentarily depress the safety foot switch.
4. Gently pull on the handle of the power head.
5. Disengage the Victaulic Power Mule II from the VG824 or VG828 tool.
6. Roll the Victaulic Power Mule II to the RIGHT and out of the way.
7. Loosen the external support roll feed nut so that the external support rolls are not contacting the pipe.
8. Slide the tool off the pipe. Set the tool on a workbench or the floor.
9. Using a rag, wipe any oil and chips off the pipe end.

DISMOUNTING THE VG824 OR VG828 TOOL WHEN USED WITH A POWER DRIVE

1. Loosen the universal drive shaft set screw. Slide the tool end of the universal drive shaft off the tool. Move the universal drive shaft out of the way.
2. Loosen the external support roll feed nut so that the external support rolls are not contacting the pipe.
3. Slide the tool off the pipe. Set the tool on a workbench or the floor.
4. Using a rag, wipe any oil and chips off the pipe end.
GROOVE DIAMETER ADJUSTMENT

1. With the 7/16-inch open-end wrench (supplied with the tool), loosen the groove diameter stop lock nut, as shown above.

2. With a regular-head screwdriver, adjust the groove diameter stop adjustment screw, as shown above. When viewed from the bottom of the tool, turn the groove diameter stop adjustment screw clockwise to increase the groove diameter (decrease groove depth). Turn the groove diameter stop adjustment screw counterclockwise to decrease the groove diameter (increase groove depth). One full turn of the groove diameter stop adjustment screw changes the groove diameter by 0.040 inch.

3. Tighten the groove diameter stop lock nut.

4. If the original groove diameter was oversized, complete the groove and re-check the groove diameter. If the original groove diameter was undersized, prepare another trial groove and check the groove diameter.

5. Repeat the steps in this section until the groove diameter is within specification.
TOOL BIT REMOVAL

1. Fully retract the tool bit by turning the tool bit feed knob (A) counterclockwise.

2. With the 7/16-inch open-end wrench (supplied with the tool), loosen the tool bit set screw jam nut, as shown above.

3. With the ¼-inch combination wrench (supplied with the tool), loosen the tool bit set screw, as shown above.

4. Insert the ¼-inch diameter steel push rod (supplied with the tool) through the rear hole in the leaf spring and into the hollow tool bit adjustment screw, as shown above. Use the push rod to push the tool bit out. Refer to the drawing above for tool bit adjustment screw location.
TOOL BIT INSTALLATION

Select the size and type of tool bit required for grooving the pipe. Tool bits are marked with the size and type (Example: 8-24 Std.). Refer to the applicable “Tool Bit/Pipe Stop Specifications” table.

1. Insert the tool bit into the tool bit arm with the cutting edge of the bit toward the external support roll, feed-nut side of the tool. Refer to the drawings above.

2. Hold the tool bit down against the tool bit adjustment screw. Tighten the tool bit set screw.

3. Tighten the tool bit set screw jam nut.

4. Check tool bit projection with an end rule between the cutting edge of the tool bit and the tool bit arm. If the projection is out of specification, refer to the “Tool Bit Projection Adjustment” section.

Projection for Carbide-Tip Tool Bits
½ inch + ½ inch/-0 inch (13 mm + 0.8 mm/-0 mm)

Projection for Standard Tool Bits
7/8 inch ± ½ inch (11 mm ± 0.8 mm)

Projection for AGS Tool Bits
9/16 inch ± ½ inch (14 mm ± 0.8 mm)
TOOL BIT PROJECTION ADJUSTMENT

1. With the 7/16-inch open-end wrench (supplied with the tool), loosen the tool bit set screw jam nut, as shown above.

2. With the ¼-inch combination wrench (supplied with the tool), loosen the tool bit set screw, as shown above.

3. With a 9/16-inch open-end wrench, loosen the tool bit projection adjustment screw jam nut. Refer to the drawing above.

4. Adjust tool bit projection by turning the tool bit projection adjustment screw with a regular-head screwdriver. Refer to the drawing above. **NOTE:** Half a turn of the tool bit projection adjustment screw will change the projection by 1/32 inch.

4a. Turning the tool bit projection adjustment screw clockwise increases tool bit projection.

4b. Turning the tool bit projection adjustment screw counterclockwise decreases tool bit projection. **NOTE:** It may be necessary to push the tool bit down against the tool bit projection adjustment screw when decreasing the projection.

5. Tighten the tool bit projection adjustment screw jam nut. **NOTE:** Use a screwdriver to prevent the tool bit projection adjustment screw from turning while tightening the tool bit projection adjustment screw jam nut.
6. Tighten the tool bit set screw.

7. Tighten the tool bit set screw jam nut.

**PIPE STOP REMOVAL AND INSTALLATION**

VG824 and VG828 tools are designed to “hug” the pipe end when driven in a clockwise direction. The tool tries to pull itself as far as possible onto the pipe end. The pipe stops limit the distance the tool can pull itself onto the pipe end, therefore controlling the “A” dimension (distance from the groove to the pipe end). The pulling action of the tool forces the pipe stops against the pipe end, resulting in a rubbing action between the pipe end and pipe stops. Eventually, this rubbing action wears down the hardened steel pipe stops, resulting in longer “A” dimensions. When the wear results in “A” dimensions that are not within Victaulic specifications, the pipe stops must be replaced.

VG824 and VG828 tools are designed with five pipe stops. All pipe sizes contact the single, center adjustable pipe stop, which is adjustable for all sizes and styles of grooving.

The two top and two bottom pipe stops are not adjustable, but each of these pipe stops cover many sizes.

The top pipe stops contact 8 – 12-inch IPS and 8-inch CI pipe sizes and must be removed for larger CI sizes.

IPS pipe in 14-inch and larger sizes clears the top pipe stops, which do not need to be removed.

The bottom pipe stops contact 14 – 24-inch IPS pipe and 10-inch and larger CI pipe.

When grooving certain sizes of CI pipe, the top and/or bottom pipe stops must be changed or removed. Refer to the applicable “Tool Bit/Pipe Stop Specifications” table.
ADJUSTING THE CENTER ADJUSTABLE PIPE STOP

1. Loosen the center adjustable pipe stop lock screw, as shown above, and back it out to clear the center adjustable pipe stop (approximately 3/8 inch).

2. Rotate the center adjustable pipe stop so that the arrow on the center adjustable pipe stop block aligns with the correct markings on the center adjustable pipe stop. Refer to the applicable “Tool Bit/Pipe Stop Specifications” table. Push in or pull out the center adjustable pipe stop so that the flat on the pipe stop is flush with the pipe stop block adjacent to the arrow.

3. Tighten the center adjustable pipe stop lock screw, making sure it engages the hole in the center adjustable pipe stop. When engaged properly, no threads on the center adjustable pipe stop lock screw will be showing.
TOP AND BOTTOM PIPE STOP REMOVAL AND INSTALLATION

1. Remove the two bolts per pipe stop with the 7/16-inch open-end wrench (supplied with the tool), as shown above.

2. Remove the pipe stops.

3. Install the pipe stops with the correct markings for the pipe size and type of grooving required. Refer to the applicable "Tool Bit/ Pipe Stop Specifications" table. The pipe stops are marked on the end, as shown above. **NOTE:** In this photo, the VG828 tool for grooving pipe to AGS specifications is shown, which is installed with pipe stops that are marked “14-24 STD/10-12 CI.”

**NOTE:** Pipe stops are reversible and can be turned over when one side is worn out. The top pipe stops must be switched right-to-left when reversed. The “Tool Bit/ Pipe Stop Specifications” tables specify removal of top pipe stops for certain types of grooving. When removed, the pipe stop bolts should be installed loosely into the removed pipe stops to prevent loss.

DRIVE ROLL REMOVAL AND INSTALLATION

The standard drive roll supplied on VG824 tools is designed for use with steel, aluminum, stainless steel, and cast iron pipe (with no linings). When lined pipe is required for grooving, the drive roll must be replaced with a urethane-coated drive roll. **THE URETHANE-COATED DRIVE ROLL IS NOT RECOMMENDED WHEN GROOVING CEMENT-LINED DUCTILE IRON PIPE.** **NOTE:** If the tool was special ordered for grooving lined pipe, the tool will be shipped with the urethane-coated drive roll mounted on the tool. Longer lead times are required for special-order tools.

The VG828 tool is designed for grooving steel pipe to AGS specifications; therefore, the drive roll supplied on the VG828 tool is designed for use with steel pipe (with no linings).

DRIVE ROLL REMOVAL

1. Remove the cotter pin and nut that secure the drive roll to the tool. **NOTE:** Victaulic recommends replacement of the cotter pin after it is removed. Use the 15/16-inch square drive on the back of the tool to keep the drive roll from turning while loosening the nut. Slide the drive roll off the tool’s shaft. Be careful not to lose the key on the tool’s shaft.

DRIVE ROLL INSTALLATION

1. Align the keyway of the drive roll with the key on the tool’s shaft. Slide the drive roll onto the tool’s shaft. Install the nut and cotter pin (provided with the new drive roll).
MAINTENANCE

Always keep the tool free from chips and grindings.

Regular lubrication of the external support rolls is required. Lubrication fittings are located on the front of the external support roll studs. A #2EP general-purpose, extreme-pressure lithium grease should be pumped into the lubrication fittings approximately once per week.

RE-SHARPENING TOOL BITS

**CAUTION**

- DO NOT attempt to re-sharpen tool bits for cast iron pipe and tool bits for AGS specifications.

Failure to follow this instruction will create a tool bit that will not produce grooves within Victaulic specifications, resulting in improper joint performance, joint failure, and property damage.

Only standard and “ES” tool bits can be re-sharpened. Tool bits for cast iron pipe and tool bits for grooving to AGS specifications MUST NOT be re-sharpened.

1. Remove the tool bit from the tool by following the “Tool Bit Removal” section.

2. Sharpen the edge(s) of the tool bit to the specifications listed in the drawing on this page. Re-grind the “G” surfaces to obtain sharp cutting edges that are free of nicks and discoloration. If the minimum length dimension cannot be maintained, the tool bit must be discarded. DO NOT attempt to use a tool bit that cannot be re-sharpened to the proper dimensions.

3. Re-install the tool bit into the tool by referring to the “Tool Bit Installation” section.

4. Adjust tool bit projection by referring to the “Tool Bit Projection Adjustment” section.
PARTS ORDERING INFORMATION

When ordering parts, the following information is required for Victaulic to process the order and send the correct part(s). Request the Repair Parts List for detailed drawings and parts listings.

1. Tool Model Number – VG824 or VG828
2. Tool Serial Number
3. Quantity, Part Number, and Description of Item
4. Where to Send the Part(s) – Company name and address
5. To Whose Attention to Send the Part(s)
6. Purchase Order Number
7. Billing Address

RECOMMENDED ACCESSORIES

VICTAULIC POWER MULE II

The Victaulic Power Mule II is a high-torque power drive for driving Victaulic Cut Grooving Tools. The power mule operates at 13 amps with a no-load operating speed of 32 rpm. Under load, the power mule runs at slower speeds. This is a very desirable feature, since heavier loads and slower speeds greatly reduce tool-bit chatter.
## TROUBLESHOOTING

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool will not fit onto pipe end.</td>
<td>The external support rolls are not retracted sufficiently.</td>
<td>Turn the external roll feed nut fully counterclockwise.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is not retracted sufficiently.</td>
<td>Turn the tool bit feed knob fully counterclockwise.</td>
</tr>
<tr>
<td></td>
<td>Pipe diameter exceeds the tool's capacity.</td>
<td>Refer to the &quot;Introduction&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Pipe wall thickness exceeds the tool's capacity.</td>
<td>Refer to the &quot;Introduction&quot; section.</td>
</tr>
<tr>
<td>Tool will not rotate.</td>
<td>The external support rolls are not tightened sufficiently.</td>
<td>Refer to the &quot;Mounting the VG824 or VG828 Tool Onto the Pipe&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Chips are wedged between the external support rolls and the pipe.</td>
<td>Loosen the external support rolls and remove any chips. Re-tighten the external support rolls.</td>
</tr>
<tr>
<td></td>
<td>The power mule or power drive is not connected to the electrical source.</td>
<td>Plug the power drive into an internally-grounded electrical source.</td>
</tr>
<tr>
<td></td>
<td>The power drive switch is in the OFF position.</td>
<td>Place the power drive switch in the position to produce clockwise rotation of the tool.</td>
</tr>
<tr>
<td></td>
<td>Dirt or rust accumulated on the drive roll.</td>
<td>Remove dirt, grime, and rust accumulation with a stiff wire brush.</td>
</tr>
<tr>
<td></td>
<td>The drive roll is worn out.</td>
<td>Replace the drive roll. Contact Victaulic for replacement parts.</td>
</tr>
<tr>
<td></td>
<td>The drive roll key is missing or sheared.</td>
<td>Replace the key. Contact Victaulic for replacement parts.</td>
</tr>
<tr>
<td>Tool will not cut.</td>
<td>The tool is being driven counterclockwise.</td>
<td>Reverse the control switch on the power drive, and drive the tool in a clockwise direction.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is not loaded against the pipe properly.</td>
<td>Refer to the &quot;Grooving Operation&quot; section.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is dull.</td>
<td>Replace or re-sharpen the tool bit. Refer to the &quot;Re-Sharpening Tool Bits&quot; section.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is installed backward.</td>
<td>Refer to the &quot;Tool Bit Installation&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Tool bit projection is not set properly.</td>
<td>Refer to the &quot;Tool Bit Projection Adjustment&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Chips have accumulated between the tool bit arm and pipe.</td>
<td>Retract the tool bit and remove any chips. Re-load the tool bit against the pipe while the tool is rotating.</td>
</tr>
<tr>
<td>Tool chatters during the cutting operation.</td>
<td>The tool bit is not loaded properly against the pipe.</td>
<td>Refer to the &quot;Grooving Operation&quot; section.</td>
</tr>
<tr>
<td></td>
<td>The power drive is running at a speed that exceeds the tool's capacity.</td>
<td>Refer to the &quot;Power Requirements for the Victaulic Power Mule II or Power Drive&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Not enough cutting oil is being used during the cutting operation.</td>
<td>Refer to the &quot;Grooving Operation&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Tool bit projection is not set properly.</td>
<td>Refer to the &quot;Tool Bit Projection Adjustment&quot; section.</td>
</tr>
<tr>
<td></td>
<td>Pipe has a hard spot or hard weld seam.</td>
<td>Increase the tool bit load slightly and oil the groove generously.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is starting to dull.</td>
<td>Replace or re-sharpen the tool bit. Refer to the &quot;Re-Sharpening Tool Bits&quot; section.</td>
</tr>
</tbody>
</table>
### TROUBLESHOOTING (CONTINUED)

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>POSSIBLE CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tool will not “hug” pipe end.</td>
<td>The tool is being driven counterclockwise.</td>
<td>Reverse the control switch on the power drive, and drive the tool in a clockwise direction.</td>
</tr>
<tr>
<td></td>
<td>The power mule is not positioned 90° to the pipe.</td>
<td>Refer to the “Attaching the Victaulic Power Mule II to the VG824 or VG828 Tool” section.</td>
</tr>
<tr>
<td></td>
<td>The power drive is not aligned with the pipe centerline.</td>
<td>Refer to the “Attaching a Power Drive to the VG824 or VG828 Tool” section.</td>
</tr>
<tr>
<td></td>
<td>The pipe is not square cut.</td>
<td>Cut the pipe end square. Refer to the “Preparing Pipe for Grooving” section.</td>
</tr>
<tr>
<td>Tool cannot be dismounted from the pipe.</td>
<td>The external support rolls are not retracted.</td>
<td>Turn the external support roll feed nut fully counterclockwise.</td>
</tr>
<tr>
<td></td>
<td>The tool bit is not retracted.</td>
<td>Turn the tool bit feed knob fully counterclockwise.</td>
</tr>
<tr>
<td>Groove diameter “C” dimension is incorrect.</td>
<td>The groove diameter is out of adjustment.</td>
<td>Refer to the “Groove Diameter Adjustment” section.</td>
</tr>
<tr>
<td></td>
<td>Tool bit projection is out of adjustment.</td>
<td>Refer to the “Tool Bit Projection Adjustment” section.</td>
</tr>
<tr>
<td></td>
<td>The pipe outside diameter varies widely from piece to piece.</td>
<td>The groove diameter adjustment must be made for each piece to ensure correct groove diameter “C” dimensions.</td>
</tr>
<tr>
<td></td>
<td>Chips have built up between the tool bit arm and the pipe.</td>
<td>Retract the tool bit arm and remove any chips. Re-load the tool bit against the pipe while the tool is rotating.</td>
</tr>
<tr>
<td></td>
<td>The tool bit has been re-sharpened beyond the specified tool bit length.</td>
<td>Replace the tool bit. Contact Victaulic for replacement parts.</td>
</tr>
<tr>
<td></td>
<td>The depth stop has worn to a point where it can’t be adjusted.</td>
<td>Replace the worn depth stop. Contact Victaulic for replacement parts.</td>
</tr>
<tr>
<td>Gasket seat “A” dimension is incorrect.</td>
<td>The incorrect tool bit and/or pipe stops are installed in the tool.</td>
<td>Refer to the applicable “Tool Bit/Pipe Stop Specifications” table.</td>
</tr>
<tr>
<td></td>
<td>The pipe stops are worn.</td>
<td>Replace the pipe stops. Contact Victaulic for replacement parts.</td>
</tr>
<tr>
<td></td>
<td>The pipe is not square cut.</td>
<td>Cut the pipe end square. Refer to the “Preparing Pipe for Grooving” section.</td>
</tr>
<tr>
<td></td>
<td>The power mule is not positioned 90° to the pipe.</td>
<td>Refer to the “Attaching the Victaulic Power Mule II to the VG824 or VG828 Tool” section.</td>
</tr>
<tr>
<td></td>
<td>The power drive is not aligned with the pipe centerline.</td>
<td>Refer to the “Attaching a Power Drive to the VG824 or VG828 Tool” section.</td>
</tr>
<tr>
<td>Groove width “B” dimension is incorrect.</td>
<td>The incorrect tool bit is installed in the tool.</td>
<td>Refer to the applicable “Tool Bit/Pipe Stop Specifications” table.</td>
</tr>
<tr>
<td></td>
<td>The power mule is not positioned 90° to the pipe.</td>
<td>Refer to the “Attaching the Victaulic Power Mule II to the VG824 or VG828 Tool” section.</td>
</tr>
<tr>
<td></td>
<td>The power drive is not aligned with the pipe centerline.</td>
<td>Refer to the “Attaching a Power Drive to the VG824 or VG828 Tool” section.</td>
</tr>
</tbody>
</table>
EXPLANATION OF CRITICAL CUT GROOVE DIMENSIONS

WARNING

- Pipe dimensions and groove dimensions must be within the tolerances specified in the tables on the following pages to ensure proper joint performance. Failure to follow these specifications could result in serious personal injury, property damage, joint leakage, and/or joint failure.

Pipe Outside Diameter – Nominal NPS Pipe Size (ANSI B36.10) and Basic Metric Pipe Size (ISO 4200) – The average pipe outside diameter must not vary from the specifications listed in the tables on the following pages. Maximum allowable pipe ovality should not vary by more than 1%. Greater variations between the major and minor diameters will result in difficult coupling assembly. For IPS pipe, the maximum allowable tolerance from square-cut pipe ends is 0.060-inch/1.5-mm for 8-inch/200-mm and larger sizes. This is measured from the true square line. Any internal and external weld beads or seams must be ground flush to the pipe surface. The inside diameter of the pipe end must be cleaned to remove coarse scale, dirt, and other foreign material that might interfere with or damage the drive roll.

For pipe being grooved to Advanced Groove System (AGS) specifications, the outside diameter must not vary from the specifications listed in this manual (API 5L end tolerance). The maximum allowable tolerance from square-cut ends is 0.063 inch/1.5 mm. This is measured from the true square line.

“A” Dimension – The “A” dimension, or the distance from the pipe end to the groove, identifies the gasket seating area. This area must be free from indentations, projections (including weld seams), deep pits, swells, and roll marks from the pipe end to the groove to ensure a leak-tight seal. All foreign material, such as loose paint, scale, oil, grease, chips, rust, and dirt must be removed. For cast pipe, peened surfaces may require corrective action to ensure a leak-tight seal.

“B” Dimension – The “B” dimension, or groove width, controls expansion, contraction, and angular deflection of flexible couplings by the distance it is located from the pipe and its width in relation to the coupling housings’ “key” width. The bottom of the groove must be free of all foreign material, such as dirt, chips, rust, and scale that may interfere with proper coupling assembly.

For pipe being grooved to AGS specifications, the corners at the bottom of the groove must be radiused. The Groove Width “B” dimension will be achieved with properly maintained Victaulic VG828 tools that are equipped with a Victaulic-supplied AGS tool bit.
“C” Dimension – The “C” dimension is the proper diameter at the base of the groove. This dimension must be within the diameter’s tolerance and concentric with the OD for proper coupling fit. The groove must be of uniform depth for the entire pipe circumference. For pipe being grooved to AGS specifications, the VG828 tool must be equipped with a Victaulic-supplied AGS tool bit.

“D” Dimension – The “D” dimension is the normal depth of the groove and is a reference for a “trial groove” only. Variations in pipe OD affect this dimension and must be altered, if necessary, to keep the “C” dimension within tolerance. This groove must conform to the “C” dimension described above.

“T” Dimension – The “T” dimension is the lightest grade (minimum, nominal wall thickness) of pipe that is suitable for cut grooving. Pipe that is less than the minimum, nominal wall thickness for cut grooving may be roll grooved.

For AWWA pipe, the tolerances must conform to Class 53 ANSI/AWWA C151/A21.51.

For pipe being grooved to AGS specifications, the absolute minimum wall thickness is 0.500 inch/12.7 mm. The maximum allowable wall thickness is 0.750 inch/19.1 mm.

“R” Dimension – The “R” dimension is the radius necessary at the bottom of the groove to eliminate a point of stress concentration for cast pipe (gray and ductile) and PVC plastic pipe.

RIGID AND FLEXIBLE RADIUS CUT GROOVES

Victaulic groove specifications for cast pipe (gray and ductile) conform to the requirements of ANSI/AWWA Standard C-606 and CSA B242.

For cast pipe, the groove is cut with a radius (“R” dimension) at the corners of the groove base to reduce stress concentration. Grooving dimensions are the same for any pipe OD, regardless of pipe class and pressure.

Standard preparation is with a rigid radius cut groove. Flexible radius cut groove dimensions may be used to provide expansion/contraction or angular movement allowance at the joint.
<table>
<thead>
<tr>
<th>Size</th>
<th>Dimensions – inches/millimeters</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>inches/mm</td>
<td>inches/mm</td>
</tr>
<tr>
<td>8 OD</td>
<td>8.000</td>
<td>203.2</td>
</tr>
<tr>
<td>216.3 mm</td>
<td>8.515</td>
<td>216.3</td>
</tr>
<tr>
<td>8 200</td>
<td>8.625</td>
<td>219.1</td>
</tr>
<tr>
<td>10 OD</td>
<td>10.000</td>
<td>254.0</td>
</tr>
<tr>
<td>267.4 mm</td>
<td>10.528</td>
<td>267.4</td>
</tr>
<tr>
<td>10 250</td>
<td>10.750</td>
<td>273.0</td>
</tr>
<tr>
<td>304.8 mm</td>
<td>12.000</td>
<td>304.8</td>
</tr>
<tr>
<td>318.5 mm</td>
<td>12.539</td>
<td>318.5</td>
</tr>
<tr>
<td>12 300</td>
<td>12.750</td>
<td>323.5</td>
</tr>
</tbody>
</table>
## STANDARD CUT GROOVE SPECIFICATIONS FOR STEEL AND OTHER NPS PIPE GROOVED WITH THE VG824 TOOL †

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 OD</td>
<td>14.000</td>
<td>13.969</td>
<td>0.938</td>
<td>0.969</td>
<td>0.907</td>
<td>0.500</td>
</tr>
<tr>
<td></td>
<td>357.2</td>
<td>354.8</td>
<td>23.8</td>
<td>24.6</td>
<td>23.0</td>
<td>12.7</td>
</tr>
<tr>
<td>377.0 mm</td>
<td>14.843</td>
<td>14.811</td>
<td>0.938</td>
<td>0.969</td>
<td>0.907</td>
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</tr>
<tr>
<td></td>
<td>379.4</td>
<td>376.2</td>
<td>23.8</td>
<td>24.6</td>
<td>23.0</td>
<td>12.7</td>
</tr>
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<td>15 OD</td>
<td>15.000</td>
<td>14.969</td>
<td>0.938</td>
<td>0.969</td>
<td>0.907</td>
<td>0.500</td>
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<td>24.6</td>
<td>23.0</td>
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<tr>
<td>16 OD</td>
<td>16.000</td>
<td>15.969</td>
<td>0.938</td>
<td>0.969</td>
<td>0.907</td>
<td>0.500</td>
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<tr>
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<td>1.031</td>
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</tr>
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<tr>
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<td>1.000</td>
<td>1.031</td>
<td>0.969</td>
<td>0.500</td>
</tr>
<tr>
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<td>26.2</td>
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<tr>
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<td>23.969</td>
<td>1.000</td>
<td>1.031</td>
<td>0.969</td>
<td>0.500</td>
</tr>
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<td>610.0</td>
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<td>25.4</td>
<td>26.2</td>
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<td>14.3</td>
</tr>
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<td>------</td>
<td>----------------------</td>
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</tr>
<tr>
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<td>9.110</td>
<td>8.990</td>
<td>0.950</td>
<td>0.930</td>
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<td>11.040</td>
<td>1.015</td>
<td>0.995</td>
<td>0.500</td>
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<tr>
<td>12 300</td>
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<td>13.260</td>
<td>13.140</td>
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<td>0.995</td>
<td>0.500</td>
</tr>
<tr>
<td>14 350</td>
<td>15.300</td>
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<td>15.220</td>
<td>1.015</td>
<td>0.995</td>
<td>0.625</td>
</tr>
<tr>
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<td>17.320</td>
<td>1.340</td>
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<td>0.625</td>
</tr>
<tr>
<td>18 450</td>
<td>19.500</td>
<td>19.550</td>
<td>19.420</td>
<td>1.340</td>
<td>1.320</td>
<td>0.625</td>
</tr>
<tr>
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<td>21.600</td>
<td>21.650</td>
<td>21.520</td>
<td>1.340</td>
<td>1.320</td>
<td>0.625</td>
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<tr>
<td>24 600</td>
<td>25.800</td>
<td>25.850</td>
<td>25.720</td>
<td>1.340</td>
<td>1.320</td>
<td>0.625</td>
</tr>
</tbody>
</table>

Dimensions – Inches/mm

- **A**: Gasket Seat
- **B**: Groove Width
- **C**: Groove Diameter
- **R**: Radius
- **T**: Minimum Allowable Wall Thickness

Victaulic is a registered trademark of Victaulic Company.
### FLEXIBLE RADIUS-CUT GROOVE SPECIFICATIONS FOR DUCTILE IRON PIPE GROOVED WITH THE VG824 TOOL

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
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</tr>
<tr>
<td>8</td>
<td>200</td>
<td>9.050</td>
<td>231.4</td>
</tr>
<tr>
<td>10</td>
<td>250</td>
<td>11.100</td>
<td>281.9</td>
</tr>
<tr>
<td>12</td>
<td>300</td>
<td>13.200</td>
<td>335.3</td>
</tr>
<tr>
<td>14</td>
<td>350</td>
<td>15.300</td>
<td>388.6</td>
</tr>
<tr>
<td>16</td>
<td>400</td>
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</tr>
<tr>
<td>18</td>
<td>450</td>
<td>19.500</td>
<td>495.3</td>
</tr>
<tr>
<td>20</td>
<td>500</td>
<td>21.600</td>
<td>548.6</td>
</tr>
<tr>
<td>24</td>
<td>600</td>
<td>25.800</td>
<td>655.3</td>
</tr>
</tbody>
</table>

Note: The table provides dimensions for the groove specifications, including pipe outside diameter, gasket seat “A”, groove width “B”, and groove diameter “C” for various nominal diameters and wall thicknesses.
### CUT GROOVE SPECIFICATIONS FOR STANDARD OR HEAVIER-WALL PIPE OR PLASTIC-COATED PIPE GROOVED WITH THE VG824 TOOL AND JOINED WITH STYLE HP-70ES ENDSEAL COUPLINGS

<table>
<thead>
<tr>
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<tbody>
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<td>8</td>
<td>200</td>
<td>8.625</td>
<td>8.688</td>
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<td>0.714</td>
<td>0.729</td>
<td>0.699</td>
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<tr>
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<td>10</td>
<td>250</td>
<td>10.750</td>
<td>10.813</td>
<td>10.719</td>
<td>0.714</td>
<td>0.729</td>
<td>0.699</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>300</td>
<td>12.750</td>
<td>12.813</td>
<td>12.719</td>
<td>0.714</td>
<td>0.729</td>
<td>0.699</td>
</tr>
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</table>
ADVANCED GROOVE SYSTEM (AGS) CUT GROOVING SPECIFICATIONS FOR CARBON STEEL PIPE GROOVED WITH THE VG828 TOOL

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Dimensions – inches/millimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>14.000</td>
</tr>
<tr>
<td>16</td>
<td>16.000</td>
</tr>
<tr>
<td>18</td>
<td>18.000</td>
</tr>
<tr>
<td>20</td>
<td>20.000</td>
</tr>
<tr>
<td>24</td>
<td>24.000</td>
</tr>
</tbody>
</table>

‡ The Groove Width “B” dimension is listed for information only. The Groove Width “B” dimension will be achieved with a properly maintained Victaulic VG828 tool that is equipped with a Victaulic-supplied AGS tool bit.
### VG824 TOOL BIT/PIPE STOP SPECIFICATIONS

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Groove Dimensions (inches/millimeters)</th>
<th>Pipe Stops Used (Marked As Shown)</th>
<th>Tool Bits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>“A”</td>
<td>“B”</td>
</tr>
<tr>
<td>Nominal Diameter</td>
<td>Actual Outside Diameter</td>
<td>inches</td>
<td>millimeters</td>
</tr>
<tr>
<td>inches/mm</td>
<td>mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEEL – STANDARD GROOVE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 200</td>
<td>8.625</td>
<td>219.1</td>
<td>0.750</td>
</tr>
<tr>
<td>8 – 12 200 – 300</td>
<td>8.625 – 12.750</td>
<td>219.1 – 323.9</td>
<td>0.750</td>
</tr>
<tr>
<td>14 – 24 OD</td>
<td>14.000 – 24.000</td>
<td>355.6 – 610.0</td>
<td>0.968</td>
</tr>
<tr>
<td>22 – 24 OD</td>
<td>22.000 – 24.000</td>
<td>559.0 – 610.0</td>
<td>0.968</td>
</tr>
<tr>
<td>‡ A 0.562-inch groove width is required for 22 – 24-inch pipe sizes in order to obtain the maximum allowable pipe end movement. The 0.500-inch groove width will provide half the maximum allowance for 22 – 24-inch pipe sizes. For the 8-inch pipe size, the 0.500 groove width does not change the allowable pipe-end movement.</td>
<td></td>
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<tr>
<td><strong>STEEL – “ES” GROOVE</strong></td>
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<td></td>
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</tr>
<tr>
<td>8 – 12 200 – 300</td>
<td>8.625 – 12.750</td>
<td>219.1 – 323.9</td>
<td>0.714</td>
</tr>
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<td><strong>CAST IRON – RIGID GROOVE (STANDARD)</strong></td>
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<td>229.9</td>
<td>0.950</td>
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<tr>
<td>10 – 12 250 – 300</td>
<td>11.100 – 13.200</td>
<td>281.9 – 335.3</td>
<td>1.015</td>
</tr>
<tr>
<td>14 350</td>
<td>15.300</td>
<td>388.6</td>
<td>1.015</td>
</tr>
<tr>
<td>16 – 24 400 – 600</td>
<td>17.400 – 25.800</td>
<td>442.0 – 655.3</td>
<td>1.340</td>
</tr>
<tr>
<td>* Measurement of groove width at top of groove only – bottom of groove is radiused</td>
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<td></td>
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</tr>
<tr>
<td><strong>CAST IRON – FLEXIBLE GROOVE</strong></td>
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</tr>
<tr>
<td>8 200</td>
<td>9.050</td>
<td>229.9</td>
<td>0.8750</td>
</tr>
<tr>
<td>10 – 12 250 – 300</td>
<td>11.100 – 13.200</td>
<td>281.9 – 335.3</td>
<td>0.9375</td>
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<tr>
<td>14 350</td>
<td>15.300</td>
<td>388.6</td>
<td>0.9375</td>
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<td>16 – 24 400 – 600</td>
<td>17.400 – 25.800</td>
<td>442.0 – 655.3</td>
<td>1.1875</td>
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<tr>
<td>* Measurement of groove width at top of groove only – bottom of groove is radiused</td>
<td></td>
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TM-VG824/VG828_36

REV_A
### VG828 TOOL BIT/PIPE STOP SPECIFICATIONS

<table>
<thead>
<tr>
<th>Nominal Diameter inches/mm</th>
<th>Actual Outside Diameter inches/mm</th>
<th>“A”</th>
<th>“B”</th>
<th>Central (Adj.)</th>
<th>Rect. (Top)</th>
<th>Rect. (Bottom)</th>
<th>Width inches/ mm</th>
<th>Marking</th>
<th>Part Number</th>
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<tbody>
<tr>
<td>14 – 24 OD</td>
<td>14.000 – 24.000, 355.6 – 610.0</td>
<td>1.500</td>
<td>0.450</td>
<td>1.500</td>
<td>14-24 OD</td>
<td>14-24</td>
<td>0.450</td>
<td>14-24 AGS</td>
<td>R-K14-828-W24</td>
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</table>

# Measurement of groove width at bottom of groove only
§ Width of tool bit at the tip