



Operating and Maintenance Instructions Manual

VE424MC and VE436MC

Pipe Roll Grooving Tools



WARNING



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

- Before operating or servicing this roll grooving tool, read all instructions in this manual and all warning labels on the tool.
- Wear safety glasses, hardhat, foot protection, and hearing protection.
- 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, Phone: 1-800-PICK VIC, e-mail: pickvic@victaulic.com.

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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

The VE424MC and VE436MC are designed only for roll grooving pipe. Use of these tools requires dexterity and mechanical skills, as well as sound safety habits. Although these tools are manufactured 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 to always practice "safety first" during each phase of use, including setup and maintenance. It is the responsibility of the owner, lessee, or user of these tools to ensure that all operators read this manual and fully understand the operation of these tools.

Read this manual before operating or servicing these tools. Become familiar with the tool's operations, applications, and limitations. Be particularly aware of its 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 the Victaulic Tool Company.

1. **These tools are designed ONLY for roll grooving pipe sizes, materials, and wall thicknesses listed in the applicable "Tool Rating and Roll Selection" section.**
2. **Avoid using the tool in dangerous environments.** Do not expose the tool to rain, and do not use the tool in damp or wet locations. Do not use the tool on sloped or uneven surfaces. Keep the work area well lit. Allow sufficient space to operate the tool properly.
3. **Ground the tool to protect the operator from electric shock.** Tool components are grounded to the frame of the tool. Make sure the frame is grounded properly.
4. **Prevent back injury.** During tool setup, one person cannot safely handle the pipe stabilizer assembly due to its weight. Two people are needed to safely lift and handle the stabilizer assembly. An alternative is to use a hoist to lift the stabilizer assembly into position.
5. **Inspect the equipment.** Before using the tool, check all moveable parts for any obstructions. Make sure guards and tool components are installed and adjusted properly.
6. **Prevent accidental startups.** Place the switch on the side of the tool to the "OFF" position when the tool is not in use.
7. **Wear proper apparel.** Do not wear loose clothing, jewelry, or anything that can become entangled in moving parts.
8. **Wear protective items when working with tools.** Always wear safety glasses, hardhat, foot protection, and hearing protection.
9. **Stay alert.** Do not operate the tool if you are drowsy from medication or fatigue. Avoid horseplay around the equipment.
10. **Keep visitors away from the immediate work area.** All visitors should be kept a safe distance from the equipment at all times.
11. **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 oil or other spills.
12. **Secure the work, tool, and accessories.** Make sure the tool is stable. Refer to the "Tool Setup" section on page 7.
13. **Support the work.** Support long pipe lengths with a pipe stand that is secured to the floor or the ground.
14. **Operate the tool only with a safety foot switch.** The power drive must be operated with a safety foot switch that is located for easy operator access. Never reach across moving parts. If the tool does not contain a safety foot switch, contact the Victaulic Tool Company.
15. **Keep hands and tools away from grooving rolls and stabilizer wheel during the grooving operation.** Grooving rolls can crush or cut fingers and hands.
16. **Do not reach inside the pipe ends during tool operation.** Pipe edges can be sharp and can snag gloves, hands, and shirt sleeves. Fingers and hands can be crushed between the pipe and lower roll.

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 operate the tool at ram speeds exceeding those specified in this manual.**
20. **Do not abuse the foot switch cord.** Keep the cord away from heat, oil, and sharp objects.
21. **Always turn off the main power supply to the tool before servicing the tool.** Only authorized personnel should attempt to perform maintenance on the tool. Always turn off the main power supply to the tool before servicing or adjusting the tool.
22. **Maintain tools with care.** Keep tools clean at all times to ensure proper and safe performance. Follow the instructions for lubricating tool components.
23. **Use only Victaulic replacement parts and accessories.** Use of any other parts may result in a voided warranty, improper operation, and hazardous situations. Refer to the "Parts Ordering Information" section on page 52 and the "Accessories" section on page 52.
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 Company.

The VE424MC and VE436MC Roll Grooving Tools are fully motorized, semi-automatic, hydraulic-feed tools for roll grooving pipe to receive Victaulic grooved pipe products. The standard VE424MC and VE436MC tools are supplied with grooving rolls for 4 – 24-inch carbon steel pipe. VE424MC rolls are marked with the size and part number, and they are color coded to identify the pipe material. For roll grooving to other specifications and materials, refer to the applicable "Tool Rating and Roll Selection" section. Grooving tools for other specifications, sizes, and materials must be purchased separately.

CAUTION

- These tools must be used **ONLY** for roll grooving pipe designated in the applicable "Tool Rating and Roll Selection" section of this manual. Failure to follow this instruction could overload the tool, resulting in reduces tool life and/or damage to the tool.

RECEIVING THE TOOL

VE424MC and VE436MC tools are palletized individually and enclosed in a wooden or cardboard sleeve, which is designed for use in re-shipping the tool back to Victaulic upon completion of the rental contract, when applicable. The stabilizer assembly and additional roll sets are shipped in separate containers.

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

VE424MC OR VE436MC CONTAINER CONTENTS



LARGE CONTAINER CONTENTS

Qty.	Description
1	VE424MC or VE436MC Pipe Roll Grooving Tool
1	8 - 12-inch Rolls Mounted on the Tool (unless ordered otherwise)
2	VE424MC/VE436MC Operating and Maintenance Instructions Manual (located in pocket inside storage compartment door)
1	Repair Parts List for the VE424MC or VE436MC (located in pocket inside storage compartment door)
1	Stabilizer Mounting Hardware (installed loose in mounting holes for stabilizer)
1	Pipe Diameter Tape
1	Hydraulic System Bleeder Tube
1	Safety Foot Switch with Detachable Line Cord
1	$\frac{3}{16}$ -inch Allen Wrench for Changing Rolls

SMALL CONTAINER CONTENTS

Qty.	Description
1	Stabilizer Assembly
1	4 - 6-inch and 14 - 24-inch AGS Roll Set for steel pipe

POWER REQUIREMENTS

DANGER

ONLY QUALIFIED ELECTRICIANS SHOULD CONNECT INCOMING POWER TO THE TOOL.

- To reduce the risk of electric shock, check the electrical source for proper grounding.
- Always turn off the main power supply to the tool before making any tool adjustments or before performing any maintenance.

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

The VE424MC and VE436MC are designed to operate on a 220/440-volt, 3-phase, 60-Hz power supply. The tools are shipped with the wiring set for 220-volt operation, unless specified otherwise on the order. To re-wire the VE424MC or VE436MC tool for 440-volt, 60-Hz service, the following conversions must be made. Refer to the electrical schematic in the repair parts list for the VE424MC or VE436MC and the information contained on the nameplate on the tool's drive motor and hydraulic pump motor.

CONVERSIONS TO 440-VOLT, 60-HZ SERVICE INCLUDE:

1. Motor Connections
2. Fuse Changes
3. Thermal Overload Unit Changes
4. Transformer Connections

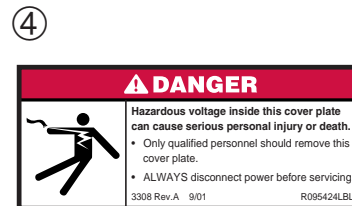
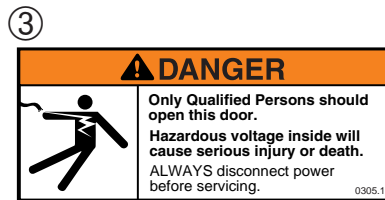
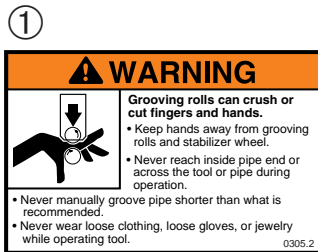
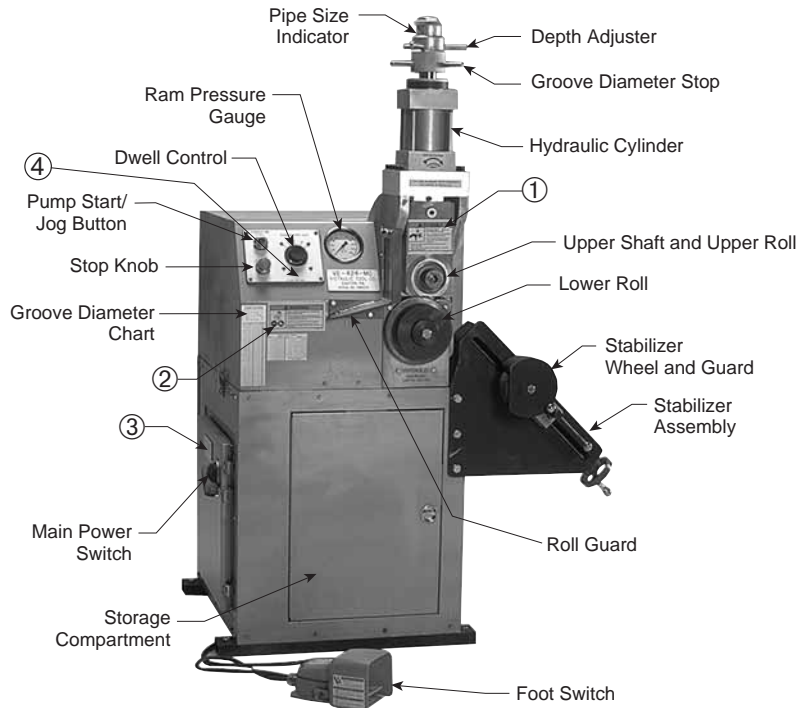
The circuit protection required for 220-volt operation is 20 amps. For 440-volt operation, 15-amp circuit protection is required. All VE424MC and VE436MC components are grounded to the frame of the tool. Make sure the frame is properly grounded.

For other voltages and frequencies, contact the Victaulic Tool Company. **NOTE:** Operation with certain voltages (i.e. 380/400 volt, 3-phase, 50/60 Hz service) requires different motors and other electrical parts. Contact the Victaulic Tool Company for information regarding operation of a tool with an alternate voltage.

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 Company.
- THE VE424MC IS SHOWN BELOW. HOWEVER, COMPONENTS ARE SIMILAR FOR THE VE436MC.



TOOL SETUP

! WARNING

- **DO NOT** turn on the main power supply to the tool until instructed otherwise.
Accidental startup of the tool could result in serious personal injury.

! WARNING

- The tool **MUST** be leveled and anchored securely on a concrete floor or base.
Failure to follow this instruction could result in serious personal injury, tool damage, and/or improper tool operation.

1. Remove all components from the packaging, and make sure all necessary items are included. Refer to the "Receiving the Tool" section on page 4.



2. The VE424MC and VE436MC tools are designed for use in a permanent location and must be located on a level concrete floor or base. After an appropriate location is chosen, the tool must be level and securely anchored (refer to Figure 1 on this page). A non-level tool can severely affect grooving operation. When checking tool level, place the level directly on the frame of the tool, as shown above.

3. Select a location for the tool and pipe stand by taking into consideration the following factors:

- 3a. The required power supply (refer to the "Power Requirements" section on page 5)

VE424MC and VE436 MC Tools

- 3b. Ambient temperature requirements of 20° F to 104° F/-21°C to 26° C

- 3c. A level concrete floor or base for the tool and pipe stand

- 3d. Adequate space to handle pipe lengths

- 3e. Adequate clearance around the tool and stabilizer assembly for adjustment and maintenance (refer to Figure 1 or Figure 2 on this page)

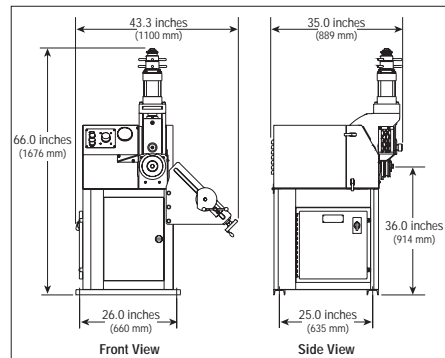


Figure 1 - VE424MC and VE436MC Tool Mounting Pattern

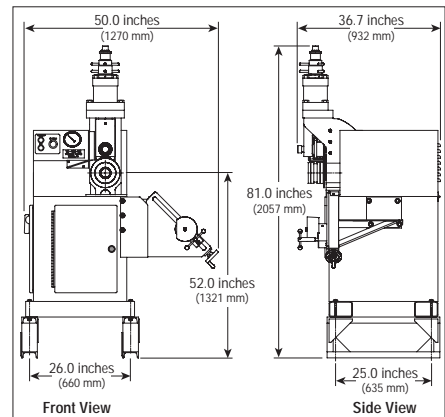


Figure 2 - VE436MC and VE424MC with 26 - 36-inch Kit Tool Mounting Pattern

! WARNING

- During tool setup, two people are needed to safely handle the stabilizer assembly due to its weight.
 - An alternative is to use a hoist to lift the stabilizer assembly into position.
- Failure to follow these instructions could result in serious personal injury.



4. Remove the six, 1/2-inch stabilizer bolts and lock washers from the front, right side of the tool. Position the stabilizer assembly onto the front, right corner of the tool so that the mounting holes in the stabilizer assembly line up with the mounting holes in the tool. Using the six, 1/2-inch stabilizer bolts and lock washers previously removed from the tool, fasten the stabilizer assembly to the tool. **NOTE:** The tool frame is designed so that no nuts are required on the ends of the bolts. Tighten all stabilizer bolts completely.

NOTICE

- VE424MC and VE436MC tools are equipped with a detachable safety-foot-switch cord. Refer to the photos below to properly insert the plug into the receptacle.
- The safety foot switch can be removed easily for storage in the cabinet with the tool is not in use.



5. Install the safety foot switch by aligning the pins/tab of the male adapter plug with the receptacle.



6. Tighten the locking ring on the plug.

POWER HOOKUP

⚠ DANGER



- **ONLY QUALIFIED ELECTRICIANS SHOULD CONNECT INCOMING POWER TO THE TOOL.**

- The tool must be properly grounded.

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

The VE424MC and VE436MC tools are supplied with a 3/4-inch nominal conduit opening for wiring incoming power. The conduit opening is located at the back of the tool near the main electrical enclosure. Incoming electrical connections must be made inside the main electrical enclosure. The incoming, three-phase power must be connected at the top of the main breaker at the upper-right side within the enclosure.

1. Make the ground connection inside the main electrical enclosure.
2. Make 3-phase electrical connections to the circuit breaker of the tool.
3. After the power is properly connected, the tool must be checked for rotational direction.

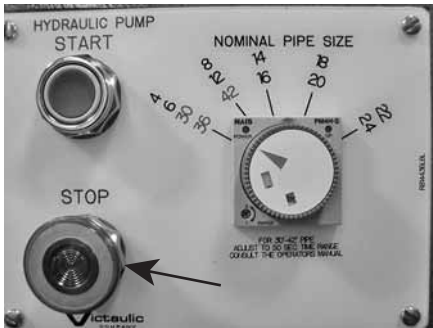


4. Turn the power switch on the side of the tool to the "ON" position.

eration Checks and Adjustments" section, starting on page 10.



9. If rotation of the lower roll is counter-clockwise, turn the power switch on the side of the tool to the "OFF" position, and proceed with the following steps.

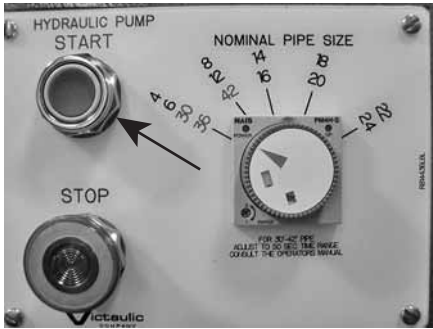


5. Pull up (out) on the red "Stop" knob.

⚠ WARNING

- Always turn off the main power supply to the tool before making any tool adjustments.

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



6. Push the "Hydraulic Pump Start" button, and hold the button in for 1 to 2 seconds. DO NOT hold the button in any longer because damage to the pump may result. Observe the rotational direction of the lower roll, then release the "Hydraulic Pump Start" button.



7. Push down (in) the red "Stop" knob.

8. Proper rotation of the lower roll is CLOCKWISE. If rotation is clockwise, power hookup is complete. Proceed to the "Pre-Op-

9a. Turn off the main power supply to the tool (main breaker panel, knife switch, etc.). Lock the switch in the "OFF" position to prevent accidental engagement. **NOTE:** Victaulic does not supply this lockout mechanism.



- 9b. Open the main enclosure. Reverse any of the two incoming lines at the top of the main breaker (located at the upper-right side within the enclosure).



- 9c. Close the main enclosure.
- 9d. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).
- 9e. Follow steps 4 – 8 to check the rotational direction. If the rotational direction is not clockwise, contact the Victaulic Tool Company.

PRE-OPERATION CHECKS AND ADJUSTMENTS

Every Victaulic roll grooving tool is checked, adjusted, and tested at the factory prior to shipment. However, before attempting to operate the tool, the following checks and adjustments should be made to ensure proper tool operation.

WARNING

- **Always turn off the main power supply to the tool before making any tool adjustments.**
Failure to follow this instruction could result in serious personal injury.

GROOVING ROLLS

Make sure the proper roll set is installed on the tool for the pipe/tubing size and material that will be grooved. Roll sets are marked with the pipe size, part number, and they are color coded for the pipe material. Refer to the applicable "Tool Rating and Roll Selection" section. If the proper rolls are not installed on the tool, refer to the "Roll Changing" section on page 25.

CAUTION

- **Make sure roll-retaining bolts and set screws are tight.**
Loose retaining bolts and set screws could cause damage to the tool and rolls.

PIPE PREPARATION


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

1. Victaulic recommends square-cut pipe for use with grooved-end pipe products. Square-cut pipe **MUST** be used with Victaulic FlushSeal® and EndSeal® gaskets. Beveled-end pipe may be used with Victaulic standard and Vic-Flange® gaskets, provided that the wall thickness is standard wall (ANSI B36.10) or less and that the bevel meets ANSI B16.25 (37 $\frac{1}{2}$ °) or ASTM A-53 (30°). **NOTE:** Roll grooving beveled-end pipe may result in unacceptable pipe flare. Beveled steel pipe in

14 – 24-inch sizes is acceptable with Victaulic Advanced Groove System (AGS) standard or FlushSeal gaskets, including AGS Vic-Flanges.

2. For 14 – 24-inch pipe grooved to AGS specifications, 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. For standard grooving of pipe sizes up to 24-inch, raised internal and external weld beads and seams must be ground flush with the pipe surface 2 inches/50 mm back from the pipe ends. For 26 – 36-inch pipe sizes, 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.

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

 CAUTION
<ul style="list-style-type: none"> For maximum grooving roll life, remove foreign material and loose rust from the interior and exterior surfaces of the pipe ends. Rust is an abrasive material that will wear the surface of grooving rolls. <p>Foreign material may interfere with or damage grooving rolls, resulting in distorted grooves and grooves that are out of Victaulic specifications.</p>

PIPE LENGTHS SUITABLE FOR GROOVING

VE424MC and VE436MC tools are capable of grooving short pipe lengths without the use of a pipe stand. Refer to the "Short Pipe Lengths" section on this page.

Pipe lengths longer than those listed in Table 1 on page 13 (and up to 20 feet/6 meters) must be supported with a pipe stand.

Pipe lengths from 20 feet/6 meters up to double-random lengths (approximately 40 feet/12 meters) must be supported with two pipe stands.

SHORT PIPE LENGTHS


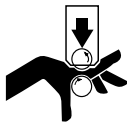

 WARNING	
	<p>Grooving rolls can crush or cut fingers and hands.</p> <ul style="list-style-type: none"> Never groove pipe that is shorter than the recommended lengths listed in this manual.

Table 1 shows the minimum and maximum pipe lengths that can be grooved without the use of a pipe stand. Refer to the "Grooving Operation" section, starting on page 20, for instructions on how to groove short pipe lengths. For pipe longer than what is shown in Table 1, refer to the "Long Pipe Lengths" section on page 12.

NOTICE
<ul style="list-style-type: none"> Grooved pipe nipples, shorter than those listed in Table 1, are available from Victaulic.

NOTICE
<p>Enhanced Tracking Rolls (ETR)</p> <ul style="list-style-type: none"> The patented Enhanced Tracking Roll (ETR) allows hands-free grooving for short pipe lengths listed in Table 1. The photos below show the differences in appearance between an ETR and the previous type of lower roll. The ETRs have two narrow grooves in the knurled surfaces, and the previous lower rolls do not.

<p>ETR Roll Original (Pre-ETR) Roll</p>
<ul style="list-style-type: none"> Roll grooving short pipe lengths will place your hands close to the rollers. Using the previous type of lower roll requires manual guidance of the pipe while grooving short lengths. The ETR allows hands-free grooving. ETRs affect the lower roll only. All upper rolls are compatible with the ETR.

LONG PIPE LENGTHS

When roll grooving pipe that exceeds the maximum length shown in Table 1, a roller-type pipe stand must be used. The roller-type pipe stand must be capable of handling the weight of the pipe, while allowing the pipe to rotate freely.

1. Make sure the tool is level. Refer to the "Tool Setup" section on page 7 for leveling requirements.
2. When pipe flare is excessive, right-to-left tracking must be kept to a minimum. It may be necessary to use less than $1/2^\circ$ for the tracking angle.

CAUTION

- **DO NOT** install couplings on pipe that exceeds the maximum allowable flare.
- Failure to follow this instruction may prevent pad-to-pad closure of the coupling housings and/or may cause damage to the gasket.

3. If the tool is properly set up in a level position, but the back end of the pipe is higher than the end being grooved, the pipe may not track. In addition, excessive flare may occur on the pipe end. Refer to the "Tool Setup" section, starting on page 7, and Figures 3 and 4 on this page for tool setup and pipe positioning requirements.

NOTICE

- Figure 3 shows the Victaulic Adjustable Pipe Stand (VAPS 224), which is suitable for 2 – 24-inch pipe.
- In addition, Victaulic offers the VAPS 112, which is suitable for $3/4$ - 12-inch pipe, and the VAPS 3036, which is suitable for 26 – 36-inch pipe.
- For additional information about pipe stands, refer to the instructions included with the pipe stand.

4. Place the pipe stand at a distance slightly beyond half the pipe length from the tool. Refer to Figure 3 below.

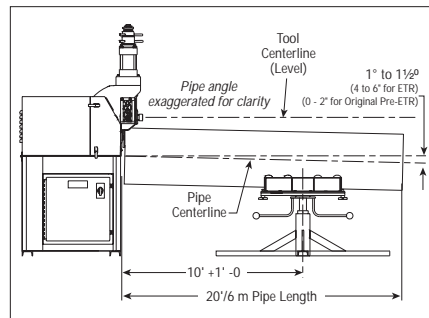


Figure 3 - Support of Pipe

5. Position the pipe stand approximately $0 - 1/2^\circ$ to the left for the tracking angle. Refer to Figure 4 below.

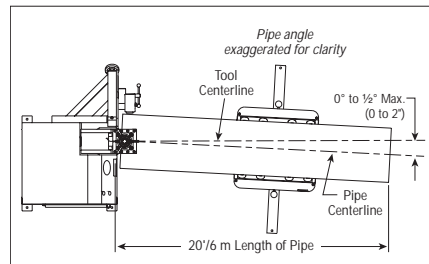


Figure 4 - Tracking Angle

6. When grooving pipe using ETR rolls, adjust the height of the pipe stand to position the pipe approximately 1° to $1 1/2^\circ$ below level ($1/4$ inch/foot or 20 mm/m). Refer to Figure 3 above. **NOTE:** The pipe must be inserted into the rolls while the height of the pipe stand is adjusted. When grooving pipe with original (Pre-ETR) rolls, use $0^\circ - 1/2^\circ$ ($1/16$ inch/foot or 5 mm/m).

CAUTION

- Make sure the pipe stand is positioned properly to minimize flaring of the pipe end.
- Always refer to the applicable "Roll Groove Specifications" table for details.

Installation of couplings on pipe that exceeds the maximum allowable flare may prevent pad-to-pad closure of the housings and/or may cause damage to the coupling gasket, resulting in property damage.

TABLE 1 – PIPE LENGTHS SUITABLE FOR GROOVING

Steel, Stainless Steel, Aluminum, and PVC Pipe Size		Length – inches/mm	
Nominal Pipe Size inches or mm	Actual Outside Diameter inches/mm	Minimum	Maximum
108.0 mm	4.250 108.0	8 205	36 915
4	4.500 114.3	8 205	36 915
4½	5.000 127.0	8 205	32 815
133.0 mm	5.250 133.0	8 205	32 815
139.7 mm	5.500 139.7	8 205	32 815
5	5.563 141.3	8 205	32 815
152.4 mm	6.000 152.4	10 255	30 765
159.0 mm	6.250 159.0	10 255	30 765
165.1 mm	6.500 165.1	10 255	30 765
6	6.625 168.3	10 255	28 715
203.2 mm	8.000 203.2	10 255	24 610
216.3 mm	8.500 216.3	10 255	24 610
8	8.625 219.1	10 255	24 610
254.0 mm	10.000 254.0	10 255	20 510
267.4 mm	10.500 267.4	10 255	20 510
10	10.750 273.0	10 255	20 510
304.8 mm	12.000 304.8	12 305	18 460
318.5 mm	12.500 318.5	12 305	18 460
12	12.750 323.9	12 305	18 460
14 OD	14.000 355.6	12 305	16 410
377.0 mm	14.843 377.0	12 305	16 410
15 OD	15.000 381.0	12 305	16 410
16 OD	16.000 406.4	12 305	16 410
426.0 mm	16.772 426.0	12 305	16 410

Steel, Stainless Steel, Aluminum, and PVC Pipe Size		Length – inches/mm	
Nominal Pipe Size inches or mm	Actual Outside Diameter inches/mm	Minimum	Maximum
18 OD	18.000 457.0		
480.0 mm	19.000 480.0		
20 OD	20.000 508.0		
530.0 mm	21.000 530.0		
22 OD	22.000 559.0		
24 OD	24.000 610.0		
650.0 mm	26.000 650.0		
26 OD	26.000 660.0		
28 OD	28.000 711.0		
30 OD	30.000 762.0		
32 OD	32.000 813.0		
36 OD	36.000 914.0		

NOTE: Always use a pipe stand when roll grooving pipe in these sizes. DO NOT roll groove pipe shorter than 18 inches/460 mm in these sizes.

If pipe is required that is shorter than the minimum length listed in Table 1, shorten the next-to-last piece so that the last piece is as long (or longer) than the minimum length specified. Refer to the example below.

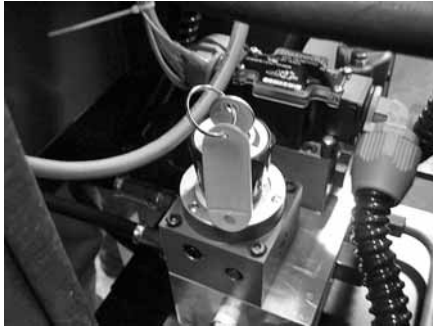
EXAMPLE: A 20-foot, 4-inch/6.2-m length of 10-inch diameter steel pipe is required to finish a section, and only 20-foot/6.1-m lengths are available. Instead of roll grooving a 20-foot/6.1-m length of steel pipe and a 4-inch/0.1-m length of steel pipe, follow these steps:

1. Refer to Table 1, and note that for 10-inch diameter steel pipe, the minimum length that should be roll grooved is 10 inches/255 mm.
2. Roll groove a 19-foot, 6-inch/5.9-m length of pipe and a 10-inch/255-mm length of pipe. Refer to the "Long Pipe Lengths" section on page 12.

RAM SPEED ADJUSTMENT

The ram speed adjustment is factory set for roll grooving steel pipe. When grooving a pipe material other than steel pipe, the ram speed must be re-adjusted.

1. Locate the key that fits the ram-speed control valve, which is inserted into the ram speed control valve at the factory. This key includes a tag that is marked with the serial number of the tool.



2. Insert the key into the ram-speed control valve (if necessary) and turn to unlock.
3. With the key inserted into the ram-speed control valve, rotate the knob until it "locks in." Adjust the ram-speed control valve to the proper setting, as indicated on this page.

Pipe Material	Ram-Speed Control Valve Setting	
	VE424MC	VE436
Steel	2.5	3.5
Steel (Grooved to AGS Specifications)	2.5	3.5
Stainless Steel (Type 304/304L and Type 316/316L)	1.5	2.5
Stainless Steel (Type 304/304L and Type 316/316L Grooved to AGS Specifications)	2.5	3.5
Aluminum (Types 6061-T4 and 6063-T4)	3.0	4.0
PVC	10.0	10.0

4. After the ram speed is set, re-lock the ram-speed control valve into position, and remove the key. Store the key in a safe location on the tool.

NOTICE

- The ram speed affects only the rate at which the upper roll forms the groove. It does not affect the rate at which the upper roll advances to contact the pipe, nor does it affect the rate at which the roll retracts from the pipe at the completion of a groove.
- Ram speed during the formation of a groove can have a significant effect on pipe flare. The settings listed in the table above will produce excellent grooves in most situations. However, if excessive flare results at these settings, reduce the setting to correct the condition. For example, with a VE424MC, adjust the ram-speed control valve to 1.5 or 2.0 for steel pipe when flare is excessive at the 2.5 setting.

PIPE STABILIZER ADJUSTMENT

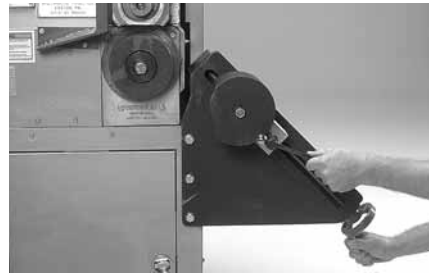
WARNING

- Always turn off the main power supply to the tool before making any tool adjustments. Failure to follow this instruction could result in serious personal injury.

The pipe stabilizer for the VE424MC and VE436MC is designed to prevent pipe sway for 5 – 24-inch NPS sizes in short and long lengths (18 – 36-inch pipe when the 26 – 36-inch kit is installed). When the stabilizer is adjusted for a selected pipe size and wall thickness, it does not require further adjustment unless pipe of a different size and wall thickness will be grooved. Pipe of the same size and wall thickness can be moved in and out of the tool without retracting the stabilizer.



1. Make sure the proper roll set is installed on the tool for the pipe size and material to be grooved. Rolls are marked with the pipe size, part number, and they are color-coded according to the pipe material. Refer to the applicable "Tool Rating and Roll Selection" section.



2. Loosen the stabilizer-locking handle. Using the hand wheel, retract the stabilizer roller to clear the pipe when it is inserted onto the lower roll.



3. Insert a length of pipe that is the correct size and schedule over the lower roll. Make sure the pipe end contacts the lower-roll backstop flange. The pipe must rest directly on top of the roll and must not be skewed to one side or the other.

CAUTION

- DO NOT adjust the stabilizer to push the pipe to the left and off center from the rolls. Increased pipe-end flare and shortened roll life will result if the pipe is pushed to the left and off center.
- Assembly of couplings on pipe that exceeds the maximum allowable flare dimension may prevent proper pad-to-pad assembly of coupling housings and gasket distortion/damage.

Failure to prepare pipe in accordance with all instructions may cause joint failure, resulting in personal injury and/or property damage.

WARNING

- DO NOT reach over pipe while making adjustments.
- DO NOT make adjustments while the tool/pipe is in operation/motion.

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

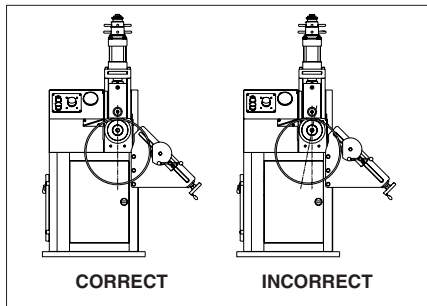
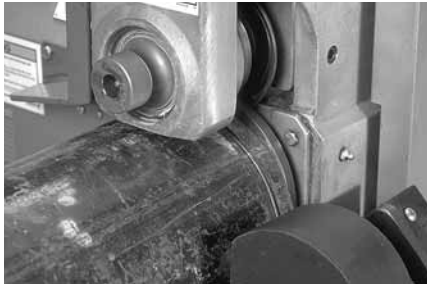


Figure 5

4. Using the hand wheel, advance the stabilizer roller inward until the roller lightly contacts the pipe. Tighten the stabilizer-locking handle. Refer to Figure 5 above for proper positioning.



5. Complete all adjustments and groove the pipe. Refer to the "Grooving Operation" section, starting on page 20. Observe the stabilizer roller while grooving. It should remain in contact with the pipe, and the pipe should rotate smoothly without swaying from side to side. If the pipe is not rotating smoothly or is swaying from side to side, discontinue grooving and adjust the stabilizer roller further inward. Continue the grooving operation and make further adjustments, as necessary. DO NOT adjust the stabilizer too far inward, since it will skew the pipe to the left and off center, resulting in excessive pipe-end flare.

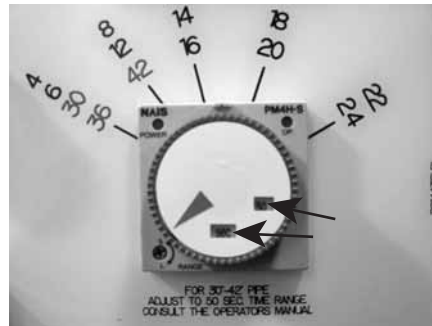
DWELL CONTROL ADJUSTMENT

The dwell control adjustment controls the length of time the tool continues to rotate the pipe after the groove diameter stop contacts the top of the hydraulic cylinder. The dwell control timer is adjustable for time range and pipe size settings.

When adjusted to the proper pipe size, the pipe will rotate a minimum of one revolution after the groove diameter stop contacts the hydraulic cylinder. This ensures that the groove in the pipe will be of uniform depth around the entire pipe circumference.

TIME RANGE

The time range setting will set the operating parameters of the timer.

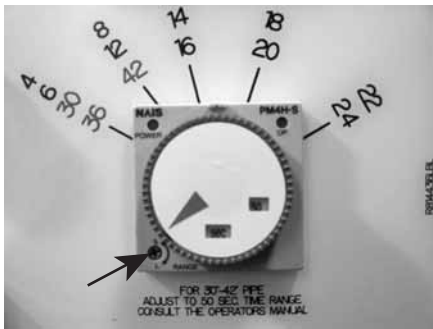


1. To adjust the time range setting, rotate the timer dial counterclockwise completely until the range settings are visible on the dial.

CAUTION

- Use only a #0 Phillips-head screwdriver to adjust the range screw.


Failure to follow this instruction may damage the screw head.



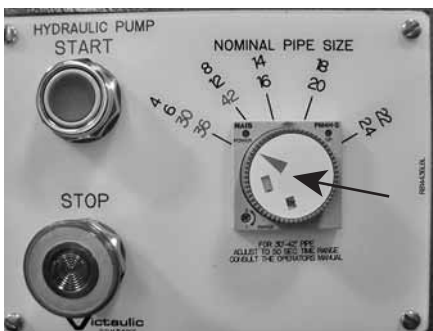
- 4 – 24-inch pipe sizes are detailed in black. Make sure the timer range is set on “SEC-10.”
- 30 – 42-inch pipe sizes are detailed in red. Make sure the timer range is set on “SEC-50.”

2. If necessary, rotate the time range screw, located in the lower left-hand corner of the timer, to the desired range shown on the dial face. **NOTE:** The VE424MC and VE436MC tools are factory set in the “SEC-10” position. Use only a #0 Phillips head screwdriver to adjust the range screw. Use of any tools other than a #0 Phillips-head screwdriver may damage the screw head.

- For 4 – 24-inch pipe sizes, set the timer range to “SEC-10”
- For 30 – 42-inch pipe sizes, set the timer range to “SEC-50”

 CAUTION
<ul style="list-style-type: none"> • The timing range must be set properly for the pipe size being grooved. <p>Failure to follow this instruction could cause excessive or insufficient dwell, resulting in improper groove diameters and grooves that are not uniform in depth.</p>

PIPE SIZE



1. Rotate the timer dial to the appropriate pipe size.

GROOVE DIAMETER STOP ADJUSTMENTS

The groove diameter stop must be adjusted for each pipe size or change in wall thickness. The groove diameter, which is identified as the "C" dimension, is listed under the "Roll Groove Specifications" section, starting on page 65. In addition, a label is affixed to the tool, which lists the "C" dimensions.

NOTICE

- To perform the following adjustments, Victaulic recommends the use of several short, scrap sections of pipe that are the proper material, diameter, and thickness to be grooved. Make sure the scrap sections meet the length requirements listed in Table 1 on page 13.

To achieve the proper diameter:

1. Determine the diameter and thickness of the pipe to be grooved.



2. Locate the proper pipe diameter and thickness on the pipe-size indicator label of the depth stop. The depth stop can be rotated for easy viewing.



3. Hold the depth adjuster to prevent it from turning. Turn the groove diameter stop clockwise several turns. Align the top edge of the depth adjuster with the lowest line position of the proper size and schedule markings.



4. Turn the groove diameter stop counter-clockwise to lock the depth adjuster in this position.

NOTICE

- The markings provide an approximate groove diameter adjustment and are not exact groove diameter settings. Variations in pipe OD and wall thickness make it impossible to calibrate the groove diameter stop exactly.



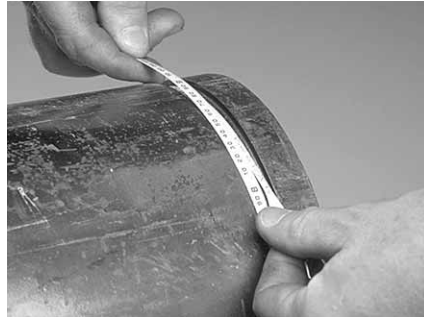
5. Insert a length of pipe over the lower roll with the pipe end against the lower-roll back-stop flange.

! WARNING	
	<p>Grooving rolls can crush or cut fingers and hands.</p> <ul style="list-style-type: none"> Always turn off the main power supply to the tool before making any tool adjustments.
<ul style="list-style-type: none"> Loading/unloading pipe will place your hands close to the rollers. Keep hands away from the grooving rolls and stabilizer wheel during operation. Never reach inside the pipe ends or across the tool or pipe during operation. Always groove pipe in a CLOCKWISE direction. Never groove pipe that is shorter than the recommended lengths listed in this manual. Never wear loose clothing, loose gloves, or anything that can become entangled in moving parts. 	



6. Prepare a trial groove. Refer to the "Grooving Operation" section, starting on page 20.

NOTICE
<ul style="list-style-type: none"> Occasionally during grooving, the groove diameter stop may move up and down slightly, making contact and then breaking contact with the hydraulic cylinder. This is normal for pipe that has a noticeable weld seam or hard spot.



7. After a trial groove is prepared and the pipe is removed from the tool, check the groove diameter ("C" dimension) carefully. Refer to the "Roll Groove Specifications" section, starting on page 65. A standard pipe tape, supplied with the tool, is the best method for checking the "C" dimension. In addition, a vernier caliper or narrow-land micrometer can be used to check this dimension at two locations (90° apart) within the groove. The average reading must be within the required groove diameter specification.

! CAUTION
<ul style="list-style-type: none"> The "C" dimension (groove diameter) must conform to Victaulic specifications to ensure proper joint performance. <p>Failure to follow this instruction could cause joint failure, resulting in personal injury and/or property damage.</p>

8. If the groove diameter ("C" dimension) is not within Victaulic specifications, the diameter stop must be adjusted.

8a. To adjust for a smaller groove diameter, turn the depth adjuster counter-clockwise (when viewed from above the tool).

8b. To adjust for a larger groove diameter, turn the depth adjuster clockwise (when viewed from above the tool).


NOTE: A quarter turn either way will change the groove diameter by 0.042 inch/1.1 mm or 0.167 inch/4.2 mm per full turn.

9. Prepare another trial groove, and check the groove diameter ("C" dimension), as described in step 7 above. Repeat these steps, as necessary, until the groove diameter is within specification.

GROOVING OPERATION

GROOVING PIPE SUPPORTED BY A ROLLER-TYPE PIPE SUPPORT

⚠ DANGER



- To reduce the risk of electric shock, check the tool for proper grounding and follow all instructions.
- Before operating the tool, review the "Operator Safety Instructions" section on page 3 of this manual.

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

⚠ CAUTION

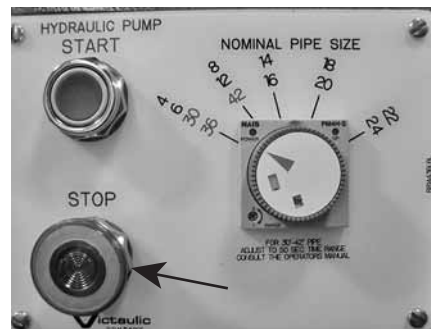
- This tool must be used **ONLY** for roll grooving pipe designated in the applicable "Tool Rating and Roll Selection" section of this manual.

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

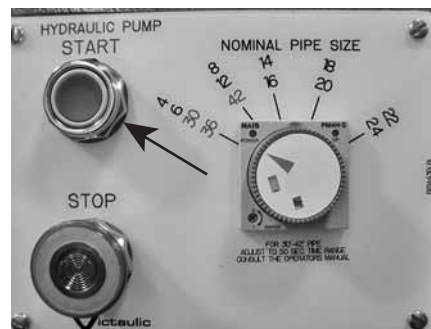
1. Before grooving, make sure all instructions in the previous sections of this manual have been followed.
2. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



3. Turn the power switch on the side of the tool to the "ON" position.

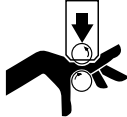


4. Pull up (out) on the red "Stop" knob.



5. Push the "Hydraulic Pump Start" button.

⚠ WARNING



Grooving rolls can crush or cut fingers and hands.

- Loading/unloading pipe will place your hands close to the rollers. Keep hands away from the grooving rolls and stabilizer wheel during operation.

- Never reach inside the pipe ends or across the tool or pipe during operation.
- Always groove pipe in a **CLOCKWISE** direction.
- Never groove pipe that is shorter than the recommended lengths listed in this manual.
- Never wear loose clothing, loose gloves, or anything that can become entangled in moving parts.



6. Insert a length of pipe that is the correct size and thickness onto the lower roll. Make sure the pipe end contacts the lower-roll backstop flange completely. Remove hands from the pipe.



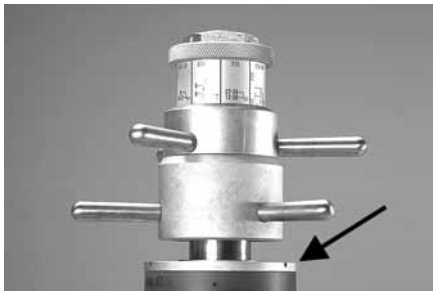
7. The operator should be positioned, as shown above.



8. To start the grooving operation, depress and hold down the safety foot switch. This will advance the upper roll into contact with the pipe. The lower roll will start rotating, and the groove will begin to form.




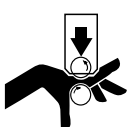
9. While grooving, visually check the tracking of the pipe as it rotates. Make sure the pipe remains against the lower-roll backstop flange. If the pipe does not stay in contact with the lower-roll backstop flange, stop the tool by releasing the safety foot switch, and withdraw foot from the switch. Make sure pipe is positioned properly (refer to the "Long Pipe Lengths" section on page 12).

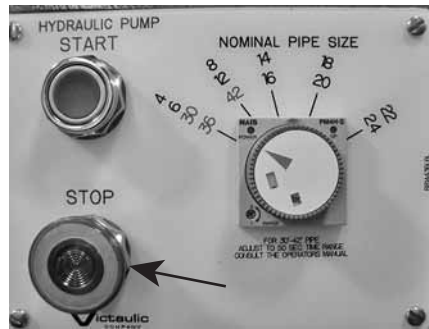


10. As grooving continues, the groove diameter stop will move down and contact the hydraulic cylinder. This contact activates a timer, which allows the pipe to rotate one to three more revolutions to ensure groove completion (refer to the "Dwell Control Adjustment" section on page 16). The tool will automatically release the pipe a few seconds later. Release the safety foot switch, and withdraw foot from the switch.

NOTICE

- Occasionally during grooving, the groove diameter stop may move up and down slightly, making contact and then breaking contact with the hydraulic cylinder. This is normal for pipe that has a noticeable weld seam or hard spot.
- Make sure short pipe lengths are properly supported.

 WARNING	
	<ul style="list-style-type: none"> • DO NOT place hand inside pipe end to pull the pipe out of the tool. • DO NOT place hands in the area of the grooving rolls or stabilizer roller.
	<p>Failure to follow these instructions may cause serious personal injury.</p>




11. After the tool releases the pipe and the rolls have stopped rotating, push down (in) on the red "Stop" knob. Remove the pipe from the tool.

NOTICE

- If the pipe remains lodged on the lower roll, pull up (out) on the red "Stop" knob, depress the "Hydraulic Pump Start" button, then push down (in) on the red "Stop" knob quickly to "jog" the lower roll. Jogging the lower roll will free the pipe. **DO NOT** attempt to pull the pipe out of the rolls while "jogging" the lower roll.
- The groove diameter must be within specification for the diameter and wall thickness of pipe. The groove diameter should be checked and adjusted, as necessary, to ensure grooves remain within specification.

GROOVING SHORT PIPE LENGTHS

⚠ DANGER



- To reduce the risk of electric shock, check the tool for proper grounding and follow all instructions.
- Before operating the tool, review the "Operator Safety Instructions" section on page 3 of this manual.

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

⚠ CAUTION

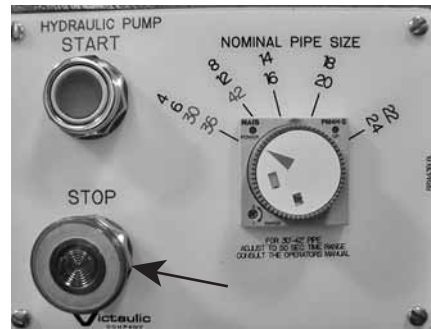
- This tool must be used **ONLY** for roll grooving pipe designated in the applicable "Tool Rating and Roll Selection" section of this manual.

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

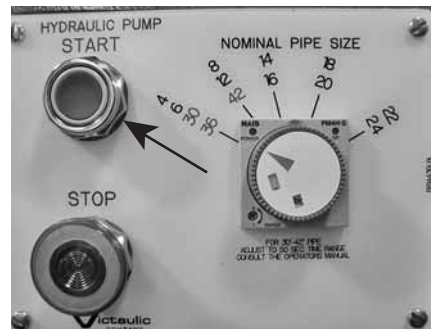
1. Before grooving, make sure all instructions in the previous sections of this manual have been followed.
2. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



3. Turn the power switch on the side of the tool to the "ON" position.

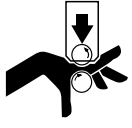


4. Pull up (out) on the red "Stop" knob.



5. Push the "Hydraulic Pump Start" button.

⚠ WARNING



Grooving rolls can crush or cut fingers and hands.

- Loading/unloading pipe will place your hands close to the rollers. Keep hands away from the grooving rolls and stabilizer wheel during operation.

- Never reach inside the pipe ends or across the tool or pipe during operation.
- Always groove pipe in a **CLOCKWISE** direction.
- Never groove pipe that is shorter than the recommended lengths listed in this manual.
- Never wear loose clothing, loose gloves, or anything that can become entangled in moving parts.



6. Insert a length of pipe that is the correct size and thickness onto the lower roll. Make sure the pipe end contacts the lower-roll backstop flange completely. While manually supporting the pipe, depress and hold down the safety foot switch. The upper roll will advance and contact the pipe.

7. If using ETR rolls (refer to "Notice" on page 10), remove hands from the pipe after the pipe begins to rotate.

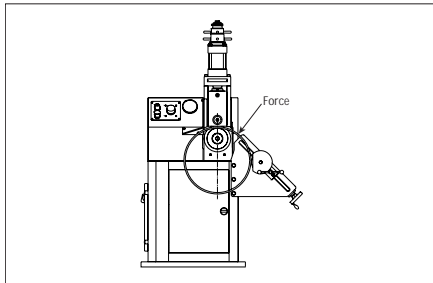
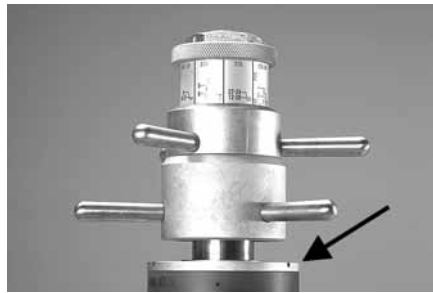


Figure 6

8. When grooving a short piece of pipe with the original (non-ETR) type of lower rolls (refer to Table 1 and the Notice on page 11), pull the pipe to the left and downward with your right hand to create a tracking force (refer to Figure 6 above). DO NOT lift up on the pipe or push it to the right, because the pipe will not track and may spin (walk) out of the rolls. Check the tracking of the pipe as it rotates to make sure it remains against the lower-roll backstop flange. If the pipe does not stay in contact with the lower-roll backstop flange, stop the tool by releasing the safety foot switch, and withdraw foot from the switch. Try grooving a new piece of pipe, and increase the tracking force by pulling the pipe harder to the left and downward.



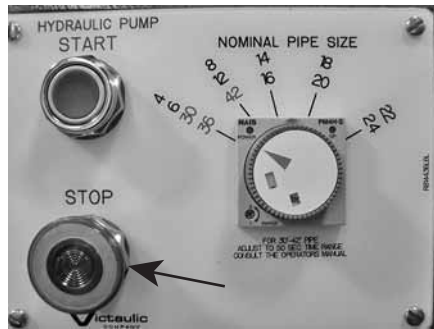
9. As grooving continues, the groove diameter stop will move down and contact the hydraulic cylinder. This contact activates a timer, which allows the pipe to rotate one to three more revolutions to ensure groove completion (refer to the "Dwell Control Adjustment" section on page 16).

9a. Release the safety foot switch, and withdraw foot from the switch.

9b. **Prepare to support the pipe because the tool will release the pipe automatically. Support the pipe as it releases from the tool.**

! WARNING	
	<ul style="list-style-type: none"> • DO NOT place hands inside the pipe end to pull the pipe out of the tool. • DO NOT place hands in the area of the grooving rolls or stabilizer roller. <p>Failure to follow these instructions may cause serious personal injury.</p>

NOTICE	
<ul style="list-style-type: none"> • Occasionally during grooving, the groove diameter stop may move up and down slightly, making contact and then breaking contact with the hydraulic cylinder. This is normal for pipe that has a noticeable weld seam or hard spot. 	



10. After the tool releases the pipe and the rolls have stopped rotating, push down (in) on the red "Stop" knob. Remove the pipe from the tool.

NOTICE

- The groove diameter must be within specification for the diameter and wall thickness of pipe. The groove diameter should be checked and adjusted, as necessary, to ensure grooves remain within specification.

ROLL CHANGING

VE424MC and VE436MC roll grooving tools are designed with rolls to accommodate several pipe sizes, which eliminates the need for frequent roll changes.

When a different pipe size or material is required for grooving, the upper and lower rolls must be changed. Refer to the following sections:

1. "Removing the Existing Roll Set" section, starting on page 26
2. "Roll Set Installation" section, starting on page 29

For larger-diameter pipe (14-inch size and larger), the following sections must be reviewed and followed, when applicable:

1. "Removal of VE424MC Original Groove System Parts for Grooving 14 – 24-inch Pipe to Advanced Groove System (AGS) Specifications or for Grooving 26 – 36-inch Pipe to Original Groove System Specifications" section, starting on page 37.
2. "Installation of Kit Components on a VE424MC for Grooving 14 – 24-inch Pipe to Advanced Groove System (AGS) Specifications or for Grooving 26 – 36-inch Pipe to Original Groove System Specifications" section, starting on page 40.
3. "Tool Height Adjustment and Stabilizer Re-Location (Required only for grooving 26 – 36-inch pipe)" section, starting on page 41.

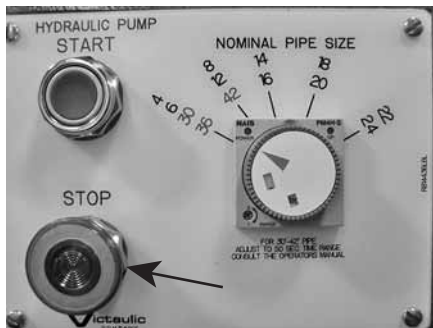
For proper roll selection, refer to the applicable "Tool Rating and Roll Selection" section.

REMOVING THE EXISTING ROLL SET

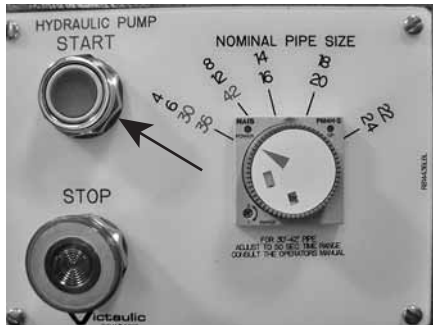
1. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



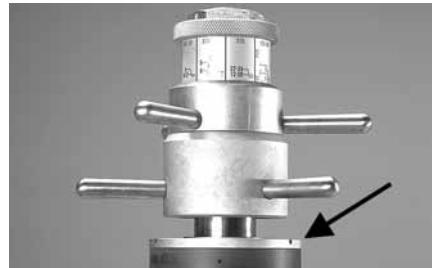
2. Turn the power switch on the side of the tool to the "ON" position.



3. Pull up (out) on the red "Stop" knob.



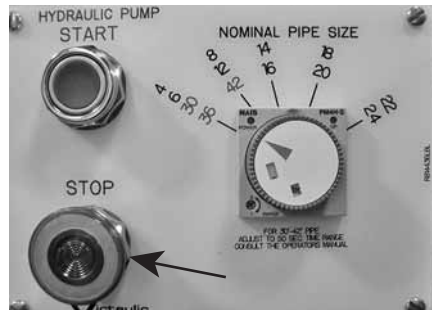
4. Push the "Hydraulic Pump Start" button.



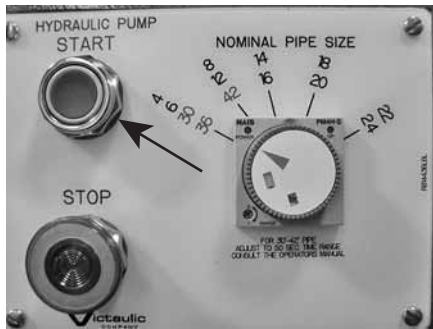
5. Depress the safety foot switch. When the groove diameter stop contacts the hydraulic cylinder, push down (in) on the red "Stop" knob. Release the safety foot switch, and withdraw foot from switch.



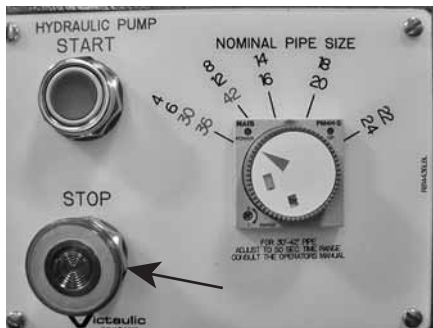
6. Remove the slide spacer by snapping it out directly, as shown above.



7. Pull up (out) on the red "Stop" knob.



8. Push the "Hydraulic Pump Start" button to retract (raise) the slide.



9. After the slide is retracted (raised) completely, push down (in) on the red "Stop" knob.



10. Turn the power switch on the side of the tool to the "OFF" position.

⚠ WARNING

- Always turn off the main power supply to the tool before making any tool adjustments.
- Failure to follow this instruction could result in serious personal injury.



11. Turn off the main power supply to the tool (main breaker panel, knife switch, etc.). Lock the switch in the "OFF" position to prevent accidental engagement. **NOTE:** Victaulic does not supply this lockout mechanism.



12. Using a $\frac{15}{16}$ -inch wrench, remove the $\frac{5}{8}$ -inch bolt and washer that secures the lower roll.

NOTICE

- Be careful not to lose the Woodruff Key. The Woodruff Key should remain in the lower shaft.
- If the Woodruff Key shows signs of damage, replace it with a new Victaulic-supplied key.



13. Pull the lower roll off the main shaft. Store the lower roll inside the tool cabinet. If the lower roll cannot be removed by hand, use a conventional gear puller. Be careful not to lose the Woodruff Key.

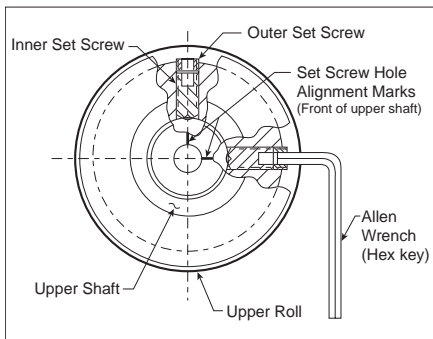


Figure 7

14. Loosen the upper roll by inserting the $\frac{3}{16}$ -inch allen wrench (supplied) into each outer set screw, as shown in Figure 7 above. Loosen each outer set screw approximately $\frac{1}{2}$ a turn.

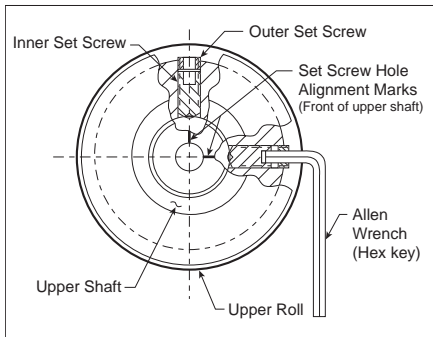


Figure 8

15. Insert the allen wrench completely through the outer set screw and into each inner set screw, as shown in Figure 8 above. Loosen each inner set screw two turns.

16. Repeat steps 14 – 15 on the remaining set screws that are 90° from the ones that were previously loosened.



17. With one hand, support the upper roll from underneath. With the other hand, withdraw the upper shaft from the slide, as shown above. When the upper shaft is withdrawn, the upper roll will drop into your hand. Remove the upper roll from the right side of the tool. Store the upper roll inside the tool cabinet with the matching lower roll.

ROLL SET INSTALLATION

WARNING

- Always turn off the main power supply to the tool before making any tool adjustments.
- Failure to follow this instruction could result in serious personal injury.

UPPER SHAFT INFORMATION

The operator must verify that the correct upper shaft is being installed in the tool. Each upper shaft has a part code stamped on the end of the shaft. Refer to the table below to identify the correct upper shaft for the grooving application.

Tool	Part Code for Upper Shaft
VE424MC that HAS NOT been converted for grooving AGS or 26 – 36-inch pipe	R-105-424-VE0 for 4 – 24-inch original groove system
VE424MC that HAS been converted for grooving AGS or 26 – 36-inch pipe	R-135-424-MCH for 4 – 24-inch original groove system
	R-105-436-VE0 for AGS or 26 – 36-inch original groove system
VE436MC	R-105-436-VE0 for all pipe preparation



- Turn the power switch on the side of the tool to the "OFF" position.



- Turn off the main power supply to the tool (main breaker panel, knife switch, etc.). Lock the switch in the "OFF" position to prevent accidental engagement. **NOTE:** Victaulic does not supply this lockout mechanism.

- For proper roll selection, refer to the applicable "Tool Rating and Roll Selection" section.



- Inspect the condition of the upper shaft bearings (front bearing and rear bearing). Replace the upper shaft bearings if damaged or excessively worn.



5. Select the proper roll set by referring to the markings on the front face of the rolls and the color codes. Refer to the applicable "Tool Rating and Roll Selection" section.



6. Select the proper upper shaft by referring to the table on the previous page. Clean all shaft surfaces and roll bores to remove any dirt and scale before installation.



7. Insert the upper roll into the slide from the right side with the roll markings facing forward.



8. Insert the upper shaft into the slide and through the upper roll and slide bearings carefully, as shown above. Make sure the shaft lines up with the front and rear bearings. The shaft should fit freely through the upper roll and bearings. DO NOT force the shaft into the tool.



9. Align the upper roll set screws with the radial lines on the front of the upper shaft, as shown above.

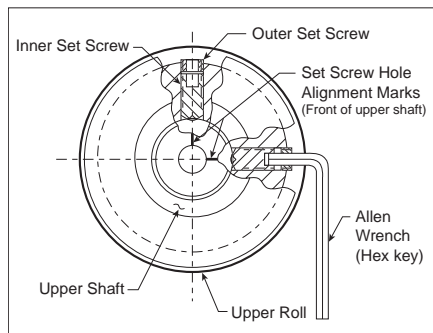


Figure 9

10. Hold the upper roll against the front shoulder of the upper shaft. With the $\frac{3}{16}$ -inch allen wrench (supplied), "feel" the inner set screw into the set screw hole on the upper shaft while tightening. The allen wrench must be in the position shown in Figure 9 above to tighten the inner set screw.

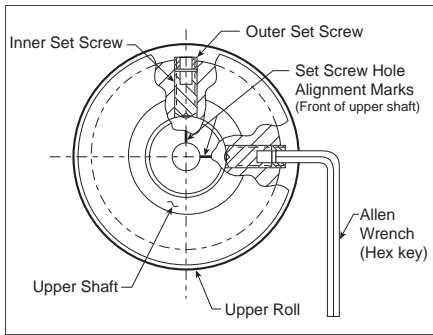


Figure 10

11. Withdraw the allen wrench to the position shown in Figure 10 above. Tighten the outer set screw securely.

12. Repeat steps 10 – 11 for the remaining set screws 90° apart from those already tightened. Make sure these set screws are aligned with a radial line on the front of the upper shaft.



13. Clean the main shaft. Apply a thin film of grease or anti-seize lubricant to the surface of the main shaft where the lower roll seats.

NOTE: A thin film of grease will permit easy removal of the lower roll the next time a change is made.



14. Install the lower roll onto the main shaft, as shown above. Make sure the lower roll fits over the Woodruff key.

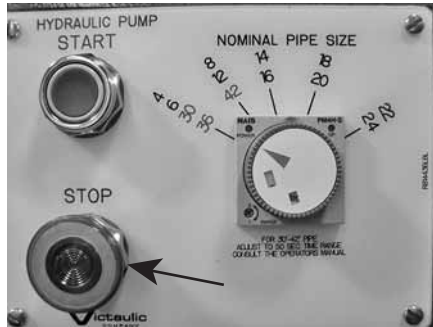


15. Install the lower roll washer and $\frac{5}{8}$ -inch bolt. Using a $\frac{15}{16}$ -inch wrench, tighten the bolt securely.

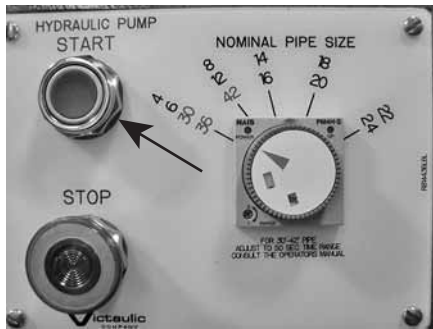
16. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



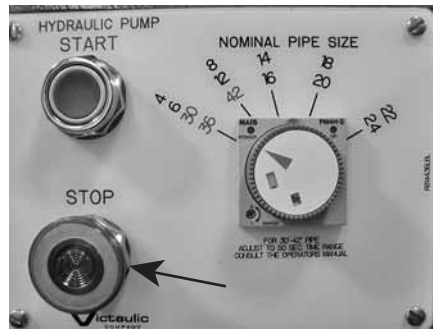
17. Turn the power switch on the side of the tool to the "ON" position.



18. Pull up (out) on the red "Stop" knob.



19. Push the "Hydraulic Pump Start" button.

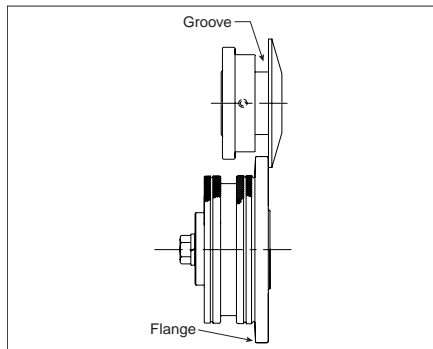


21. After the slide has advanced approximately 1 inch/25 mm, and the rolls are aligned and engaged, push down (in) on the red "Stop" knob.

WARNING

Grooving rolls can crush or cut fingers and hands.

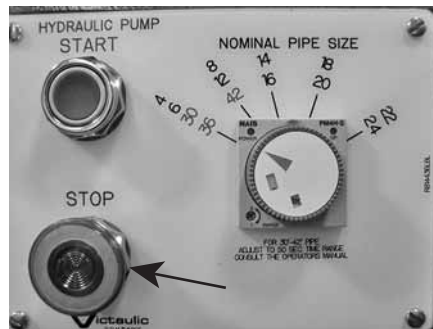
- Keep hands away from the grooving rolls and stabilizer wheel.



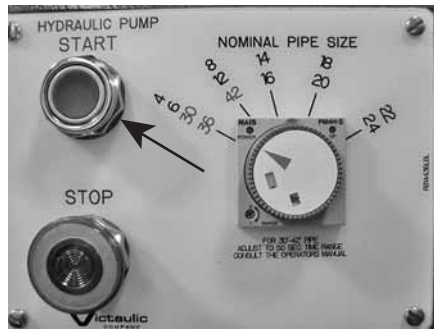
20. Depress the safety foot switch, and align the upper roll "groove" with the lower-roll backstop flange as the slide advances. Align the upper roll by pushing or pulling on the knob on the front of the upper shaft.



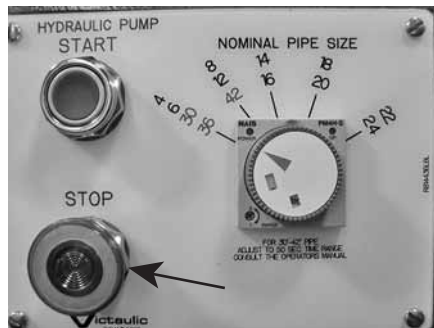
22. Snap the slide spacer into the tool, as shown above.



23. Pull up (out) on the red "Stop" knob.



24. Push the "Hydraulic Pump Start" button to fully retract (raise) the slide.



25. After the slide has retracted completely, push down (in) on the red "Stop" knob.



26. Grease the upper shaft bearings, as shown, by applying grease through the lubrication fitting on the front of the upper shaft. Refer to the applicable "Recommended Lubricants" table on page 50 for the proper grease.

27. Roll set installation is now complete. Before grooving, make sure all instructions in the previous sections of this manual have been followed.

**Instructions for Converting a VE424MC
or VE436MC for Grooving 14 – 24-inch
Pipe to Advanced Groove System
(AGS) Specifications**

OR

**Instructions for Converting a VE424MC
or VE436MC for Grooving 26 – 36-inch
Pipe to Original Groove System
Specifications**

CONTENTS OF CONVERSION KITS

CONTENTS OF KIT FOR GROOVING 14 – 24-INCH PIPE FOR THE ADVANCED GROOVE SYSTEM (AGS)

Qty.	Description
1	Upper Shaft for 14 – 24-inch AGS Roll Sets and 26 – 36-inch Original System Roll Sets
1	Slide for Grooving 14 – 24-inch Pipe to AGS Specifications and 26 – 36-inch Pipe to Original Groove Systems Specifications
1	Roll Set for Grooving 14 – 24-inch Pipe to AGS Specifications
1	Upper Shaft for Grooving 4 – 24-inch Pipe to Original Groove System Specifications (Used with the New Slide Provided in This Kit)
1	Pipe-Size Indicator Label for Grooving Pipe to AGS Specifications
1	Groove-Diameter Specification Label for Grooving Pipe to AGS Specifications

NOTICE

- When grooving 14 – 24-inch stainless steel pipe for the Advanced Groove System (AGS), special lower and upper rolls are required. Specify this requirement on the order, along with the size and wall thickness of pipe to be grooved.

CONTENTS OF KIT FOR GROOVING 26 – 36-INCH STEEL PIPE TO ORIGINAL GROOVE SYSTEM SPECIFICATIONS

Qty.	Description
1	Upper Shaft for 26 – 36-inch Original Groove System Roll Sets
1	Slide for Grooving 26 – 36-inch Pipe
2	Tool Supports
2	Stabilizer Extensions and Hardware
1	Roll Set for Original System Grooving 26 – 36-inch Pipe
NOTE: Special rolls are required for original system grooving 26 - 36-inch stainless steel pipe. Specify this requirement on the order, along with the wall thickness of stainless steel pipe to be grooved.	

NOTICE

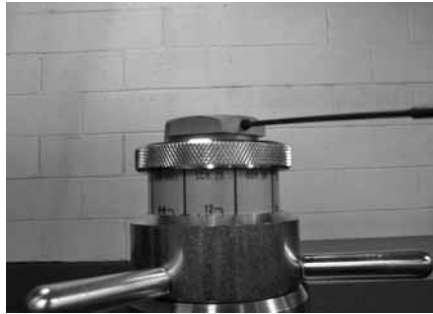
- After making the conversion to the new slide, there is no need to convert the tool back to the previous slide for grooving 4 – 24-inch pipe. The extra shaft, provided in the kit, will allow the 4 – 24-inch original groove system rolls to be used.

REPLACEMENT OF LABELS For Adding Grooving Capabilities for 14 – 24-inch Pipe for the Advanced Groove System (AGS)

PIPE-SIZE INDICATOR LABEL



1. Turn the power switch on the side of the tool to the "OFF" position.
2. Turn off the main power supply to the tool (main breaker panel, knife switch, etc.).



3. Using a hex key, loosen the set screw on the depth calibration nut, as shown above.



4. Loosen and remove the depth calibration nut.



5. Remove the depth adjuster barrel from the depth adjuster.



6. Remove the existing pipe-size indicator label from the depth adjuster barrel.



7. Remove part of the backing from the new pipe-size indicator label. Start the new label on the depth adjuster barrel, making sure the label stays centered within the recess in the depth adjuster barrel. Remove the remainder of the backing from the pipe-size indicator label, and finish wrapping the label around the depth adjuster barrel.



8. Re-insert the depth adjuster barrel into the depth adjuster.



9. Re-install the depth calibration nut. DO NOT tighten the depth calibration nut completely. The depth adjuster barrel should be able to rotate easily. If the depth adjuster barrel cannot be rotated easily, back off the depth calibration nut a full turn.



10. Using the hex key provided in the kit, tighten the set screw on the depth calibration nut.

GROOVE-DIAMETER SPECIFICATION LABEL

Affix the new groove-diameter specification label, provided in the kit, to the front of the tool where the previous groove-diameter specification labels are affixed. Refer to this label and the grooving tables, starting on page 68, when grooving 14 – 24-inch pipe to Advanced Groove System (AGS) specifications.

VE424MC and VE436 MC Tools

REMOVAL OF VE424MC ORIGINAL GROOVE SYSTEM PARTS

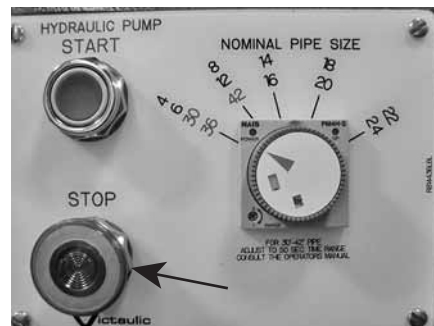
for Grooving 14 – 24-inch Pipe to Advanced Groove System (AGS) Specifications

or for Grooving 26 – 36-inch Pipe to Original Groove System Specifications

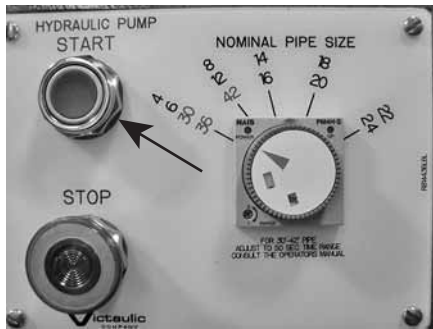
1. Remove the upper and lower grooving rolls. Refer to the "Removing the Existing Roll Set" section, starting on page 26.
2. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



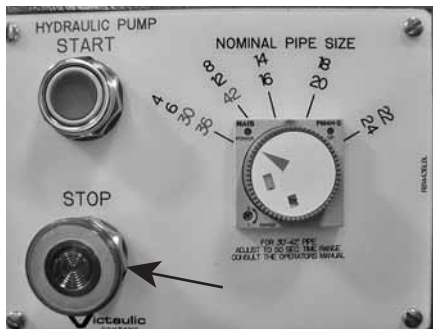
3. Turn the power switch on the side of the tool to the "ON" position.



4. Pull up (out) on the red "Stop" knob.



5. Push the "Hydraulic Pump Start" button.



6. Depress the safety foot switch. When the slide moves to its lowest position, push down (in) on the red "Stop" knob. Release the safety foot switch, and withdraw your foot from the switch.



7. Turn the power switch on the side of the tool to the "OFF" position.

⚠ WARNING

- Always turn off the main power supply to the tool before making any tool adjustments.

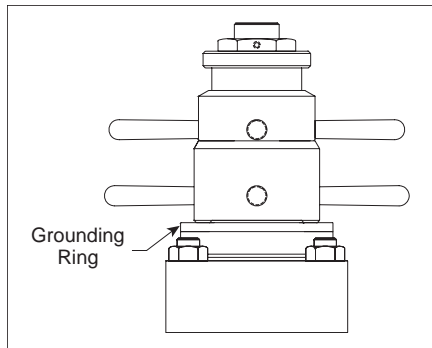
Failure to follow this instruction could result in serious personal injury.



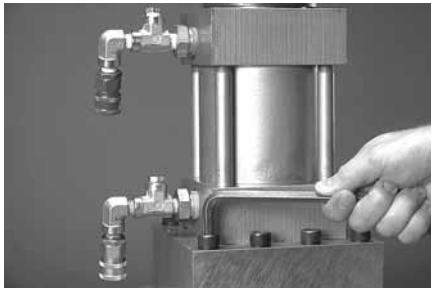
8. Turn off the main power supply to the tool (main breaker panel, knife switch, etc.). Lock the switch in the "OFF" position to prevent accidental engagement. **NOTE:** Victaulic does not supply this lockout mechanism.



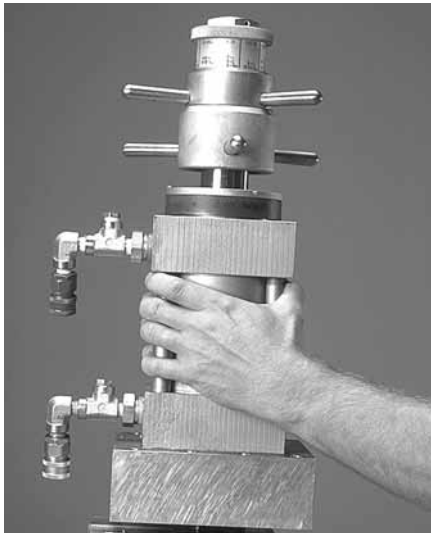
9. Disconnect the hydraulic hoses at the rear of the cylinder. Plug or cap the end of the hose and cylinder ports to prevent loss of hydraulic fluid. If the tool is equipped with quick connectors, it is not necessary to cap the ends.



9a. Disconnect the wire from the grounding ring near the top of the cylinder.



10. Remove the eight socket-head cap screws from the cylinder-mounting block.



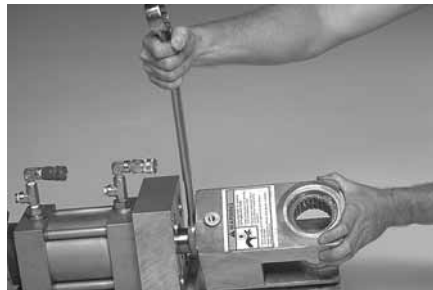
11. Remove the cylinder and the slide assembly by lifting straight up and out of the tool. Place the cylinder and the slide assembly face down on a work surface.



12. Remove the upper-shaft spring by removing the two screws.



13. Turn the slide over, and loosen the set screw two full turns.



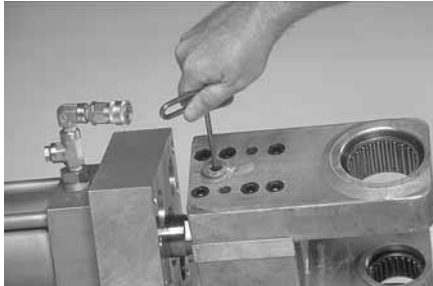
14. Place a 1½-inch open-end wrench on the flats of the cylinder shaft directly above the slide. Turn the slide counterclockwise to remove it completely from the shaft. Be careful not to damage the threads on the shaft and in the slide.

**INSTALLATION OF KIT
COMPONENTS ON A VE424MC
for Grooving 14 – 24-inch Pipe to
Advanced Groove System (AGS)
Specifications**

**or for Grooving 26 – 36-inch Pipe to
Original Groove System Specifications**



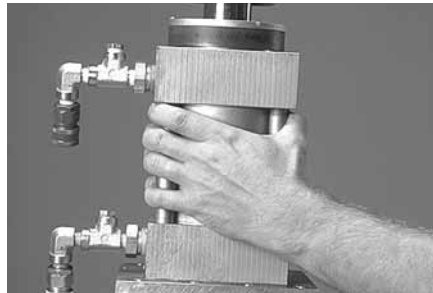
1. Install the larger (deeper) slide (supplied with the kit) by threading it onto the cylinder shaft clockwise until the shoulder on the shaft contacts the top of the slide. Resist rotation of the cylinder shaft by placing a 1½-inch open-end wrench on the flats while tightening.



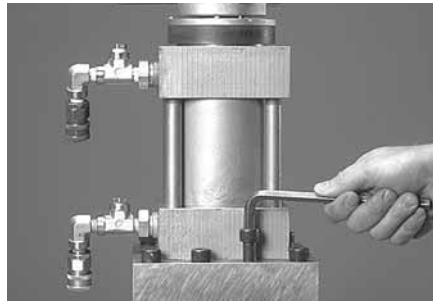
2. Tighten the set screw securely.



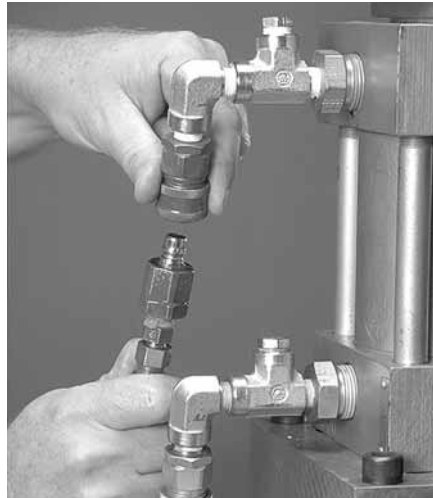
3. Rotate the slide so that the upper shaft spring is on the same side as the hydraulic connections. Replace the upper shaft spring with the two screws.



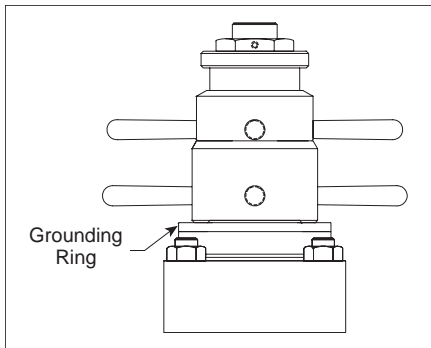
4. With the hydraulic connections facing the rear, install the upper slide and cylinder assembly into the tool-head housing.



5. Rotate the cylinder until the hydraulic connections face the rear. Insert the eight socket-head cap screws through the mounting block, and thread them into the tool head housing. Tighten these bolts evenly by alternating sides.



6. Connect the hydraulic lines to the back of the hydraulic cylinder.



6a. Connect the wire to the grounding ring at the top of the cylinder.

If preparing the tool to groove pipe to AGS specifications: Skip to the "Air Bleeding" section on page 48 to remove any air that may have entered the hydraulic system while changing the slide.

If preparing the tool to groove 26 – 36-inch pipe: Follow the Tool Height Adjustment and Stabilizer Re-Location (Required only for grooving 26 – 36-inch pipe) section that follows.

TOOL HEIGHT ADJUSTMENT AND STABILIZER RE-LOCATION (Required only for grooving 26 – 36-inch pipe)

⚠ WARNING

- Always turn off the main power supply to the tool before making any tool adjustments. Failure to follow this instruction could result in serious personal injury.

1. Remove the bolts that secure the tool to the floor.

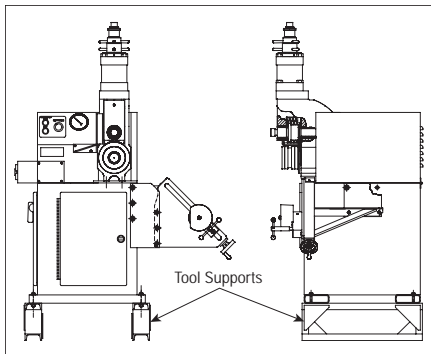


2. Turn off the main power supply to the tool (main breaker panel, knife switch, etc.). Lock the switch in the "OFF" position to prevent accidental engagement. **NOTE:** Victaulic does not supply this lockout mechanism.

NOTICE

- If the tool is connected to the power supply by rigid conduit, provisions must be made at this time to disconnect and rework the conduit.

3. Move the tool out of the way to make room for the new tool supports.



4. Secure the tool supports (supplied in the kit) to the floor, front to back, using the original anchor bolts.



5. Place the tool on top of the tool supports. Secure the tool to the tool supports by using the four, $\frac{1}{2}$ - 13 x 3-inch long bolts with the washers and nuts supplied in the kit.

! WARNING

- During tool setup, one person cannot safely handle the pipe stabilizer assembly. Two people are required to safely handle the stabilizer assembly.
- Use a hoist to lift the stabilizer assembly into position.

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



6. Remove the stabilizer assembly from the side of the tool by removing the six, $\frac{1}{2}$ -inch stabilizer bolts and lock washers.



7. Attach the front stabilizer extension (supplied in the kit) to the front of the tool using the existing hardware.



8. Attach the rear stabilizer extension to the side of the tool, as shown above, by using the two, $\frac{1}{2}$ - 13 x 4-inch long bolts with the washers supplied in the kit.

! WARNING

- During tool setup, one person cannot safely handle the pipe stabilizer assembly. Two people are needed to safely handle the stabilizer assembly due to its weight.
- An alternative is to use a hoist to lift the stabilizer assembly into position.

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



9. Re-attach the stabilizer assembly. Place the stabilizer assembly behind the front extension and on top of the rear extension. Install and tighten the three, $\frac{1}{2}$ - 13 x $1\frac{1}{4}$ -inch long bolts with the lock washers supplied in the kit. Use the existing bolts and lock washers to attach the stabilizer assembly to the rear extension.

10. If the tool was disconnected from the incoming power, re-connect the power at this time.

11. Follow the "Air Bleeding" section on page 48 to remove any air that may have entered the hydraulic system while changing the slide.

WARNING

- The upper shaft for 26 – 36-inch roll sets **MUST** be used when grooving 26 – 36-inch pipe.

Failure to follow this instruction could result in tool damage and/or grooves that are not within Victaulic specifications.

12. Install the upper shaft for 26 – 36-inch pipe, which is provided in the conversion kit, along with the rolls by referring to the "Roll Set Installation" section, starting on page 29.

13. Adjust the pipe stabilizer by following the "Pipe Stabilizer Adjustment" section, starting on page 15.

NOTICE

- For the initial groove depth setting, set the depth adjuster to the 24-inch, standard-weight pipe mark, and rotate the depth adjuster one full turn counter-clockwise.
- For dwell control adjustment, set the pointer to the 30 – 36 position. Refer to page 15 for this adjustment.

14. Refer to the "Grooving Operation" section, starting on page 20, to groove the pipe.

MAINTENANCE

⚠ DANGER	
	<ul style="list-style-type: none">• Always turn off the main power supply to the tool before making any tool adjustments or before performing any maintenance. <p>Failure to follow this instruction could result in death or serious personal injury.</p>

This section provides information about keeping tools in proper operating condition and guidance for making repairs when it becomes necessary. Preventive maintenance during operation will pay for itself in repair and operating savings.

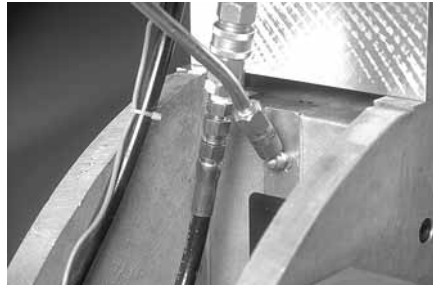
Replacement parts must be ordered from Victaulic Tool Company to ensure proper and safe operation of the tool.

LUBRICATION

1. After every 8 hours of operation, lubricate the tool. Always lubricate the upper roll bearings when rolls are changed.



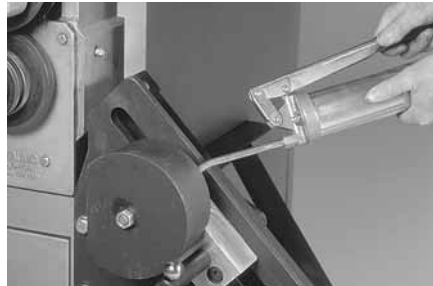
2. Grease the upper shaft bearings every time roll changes are made and after every 8 hours of operation. A grease fitting is provided on the front of the upper shaft. Refer to the applicable "Recommended Lubricants" table on page 50 for the proper grease.



3. Grease the slide gibs. The slide gib grease fitting is located on the back of the slide and is accessible when the tool hood is open.



4. Grease the main shaft bearings through the fitting located on the side of the tool.



5. Grease the stabilizer wheel.

CHECKING AND FILLING GEAR REDUCER OIL

The gear reducer oil level must be checked annually. If leakage is present, repairs must be made to correct the leak.

1. Remove the oil level plug from the gear reducer. Refer to Figure 11 below. The oil level should be even with the bottom of the hole.

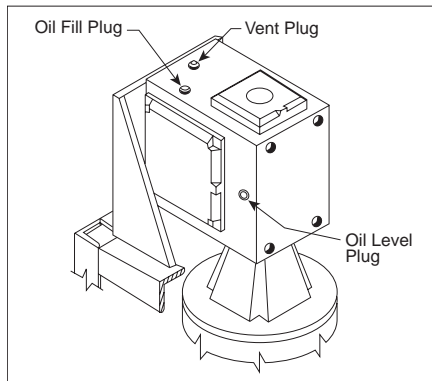


Figure 11

2. To add oil, remove the plug from the top of the gear reducer and fill to the proper level (refer to Figure 11 above). Refer to the card attached to the gear reducer for the proper lubricant.
3. Re-install the plug(s).

CHECKING AND FILLING HYDRAULIC OIL

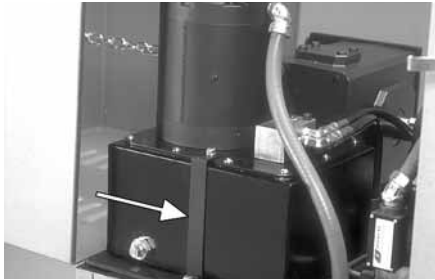


1. Check the hydraulic oil level on a monthly basis. The level should be 1 – 2 inches/25 – 50 mm below the top of the tank. DO NOT over-fill the tank because the oil may overflow due to thermal expansion. Refer to the applicable "Recommended Lubricants" table on page 50 for the proper hydraulic oil.

REPLACING HYDRAULIC OIL AND FILTER

Replace the hydraulic oil and oil filter annually or every 2000 hours of operation, whichever comes first.

1. Raise the hood of the tool.



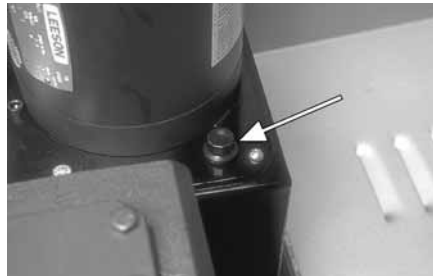
2. Locate the two brackets that hold the oil reservoir to the frame.



3. Loosen the screws on the bracket closest to the drain plug. Remove the bracket and set it aside.



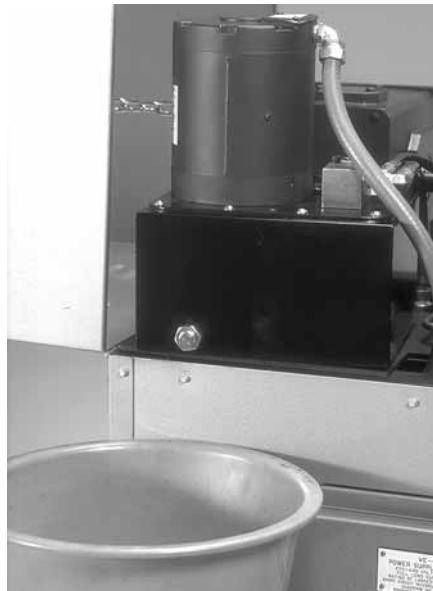
4. On the other bracket, loosen and remove the screw on top of the reservoir. There is no need to loosen the screw that holds the bracket to the frame.



5. Remove the fill/vent plug from the top of the reservoir.



6. Slide the reservoir partially over the side of the tool. DO NOT disconnect any electrical or hydraulic lines.



7. Position a container underneath the drain plug. Make sure the container is large enough to hold 2 gallons/8 liters of oil.



8. Remove the drain plug to drain the oil.



9. Replace the drain plug. Slide the reservoir back into position, and re-attach the brackets.



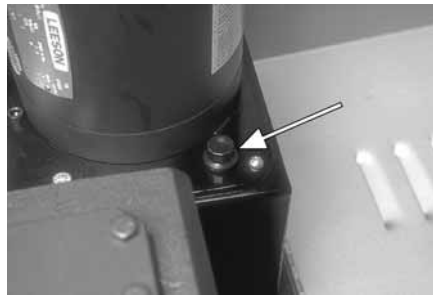
10. Place a tray under the oil filter. Remove the oil filter.



11. Lubricate a new oil filter gasket with new hydraulic oil. Fill the filter with oil. Install the new filter hand-tight.



12. Fill the tank with new hydraulic oil to 1 – 2 inches/25 – 50 mm from the top of the tank. Refer to the applicable "Recommended Lubricants" table on page 50.

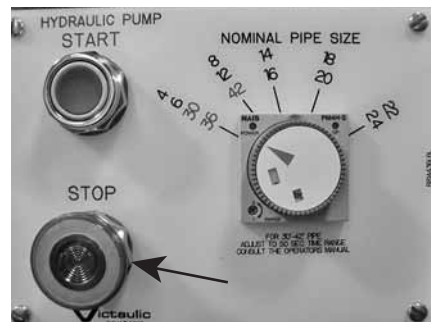


13. Install the fill/vent plug.

14. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).

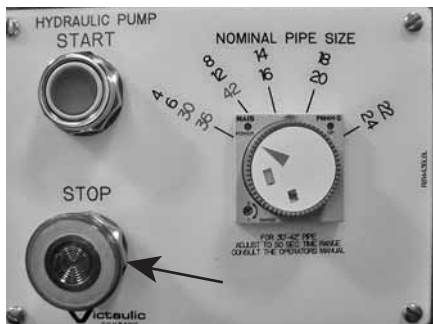


15. Turn the power switch on the side of the tool to the "ON" position.

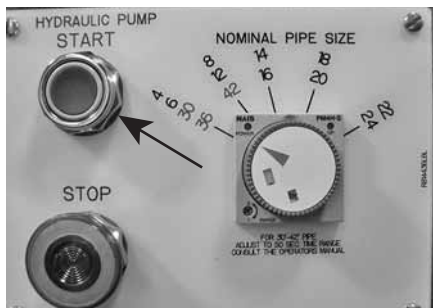


19. Push down (in) on the red "Stop" knob.

20. Follow the "Air Bleeding" section on page 48.



16. Pull up (out) on the red "Stop" knob.

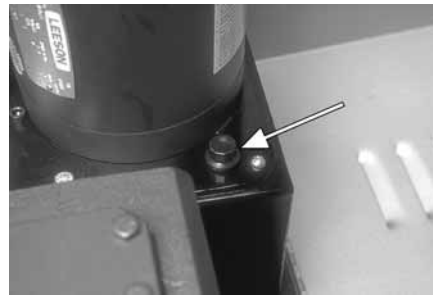


17. Push the "Hydraulic Pump Start" button.



18. Check the hydraulic oil level. Add oil, as necessary.

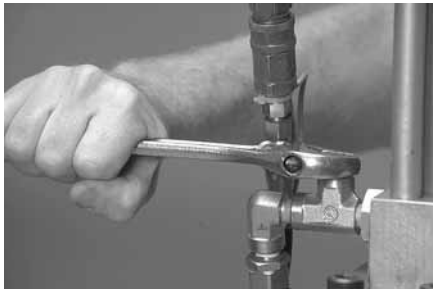
AIR BLEEDING



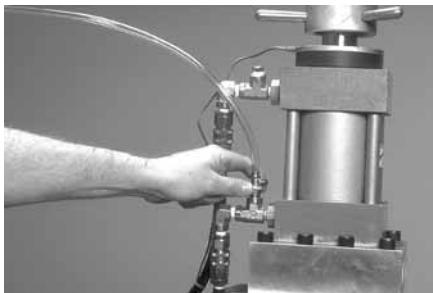
1. Remove the fill/vent plug from the hydraulic tank.



2. Bring the hydraulic oil level up to 1 – 2 inches/25 – 50 mm from the top of the tank. Refer to the applicable "Recommended Lubricants" table on page 50 for the proper hydraulic oil.



3. Remove the plug from the tee at the bottom of the hydraulic cylinder port.

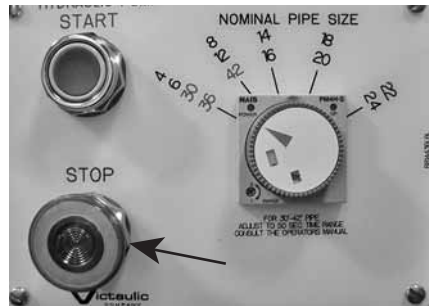


4. Install the bleeder tube into the tee, as shown above. Insert the other end of the bleeder tube into the fill/vent hole in the hydraulic tank. **NOTE:** The bleeder tube consists of 1/4-inch NPT barb hose fitting and 4 feet/1.2 m of 1/4-inch ID clear vinyl hose (supplied with the tool).

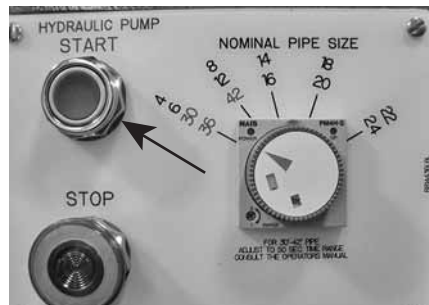
5. Turn on the main power supply to the tool (main breaker panel, knife switch, etc.).



6. Turn the power switch on the side of the tool to the "ON" position.

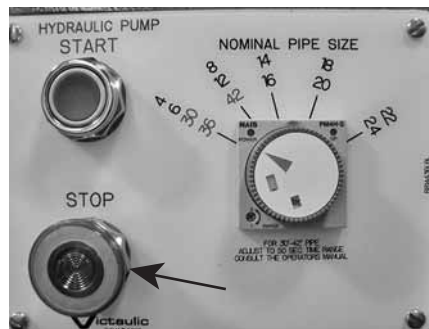


7. Pull up (out) on the red "Stop" knob.



8. Push the "Hydraulic Pump Start" button. Hydraulic oil will start flowing from the tee through the bleeder tube and into the tank.

9. Depress the safety foot switch, hold it down for 5 seconds, the release it for 5 seconds. Repeat this step until no air bubbles can be seen through the clear vinyl tube.



10. Push down (in) on the red "Stop" knob.

NOTICE

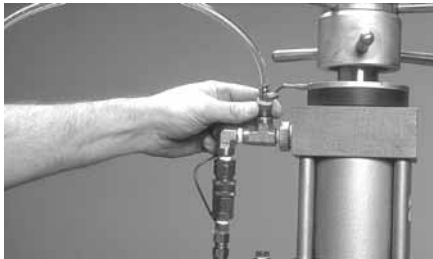
- To prevent oil from flowing out of the tee while removing the bleeder tube and installing the plug: Block the groove diameter stop from moving down by inserting a piece of wood between the groove diameter stop and the top of the hydraulic cylinder.



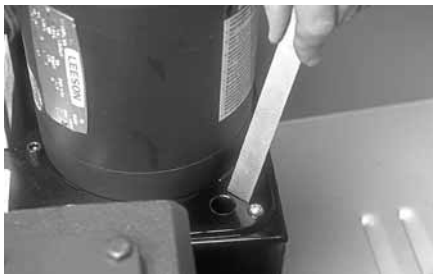
11. Remove the bleeder tube, and install the plug into the tee. **DO NOT ALLOW AIR TO GET BACK INTO THE TEE WHEN INSTALLING THE PLUG (REFER TO NOTICE BELOW).**

NOTICE

- To prevent air from entering the tee while the bleeder tube is removed and the plug is installed: Hold the 4-way valve in the "shifted" position by pressing in on the rubber boot on the end of the valve. Keep the rubber boot depressed until the plug is installed and tightened.



12. Repeat steps 4 – 11 for bleeding air from the tee at the top of the hydraulic cylinder port. Refer to the photo above for bleeder tube installation.



13. Bring the hydraulic oil level up to 1 – 2 inches/25 – 50 mm from the top of the tank. Refer to the applicable "Recommended Lubricants" table on page 50 for the proper hydraulic oil.

RECOMMENDED LUBRICANTS

BEARING AND SLIDE GREASE

(General Purpose EP Lithium Base Grease)

Manufacturer	Product
BP Amoco	Energrease LC-EP2
Gulf Oil Corp.	Gulfcrown Grease EP#2
Lubriplate	No. 630-2
Mobil Oil Corp.	Mobilux EP2
Pennzoil Products Co.	Pennlith EP 712 Lube
Shell Oil Co.	Alvania EP2
Sun Refining	Sun Prestige 742 EP
Texaco Inc.	Multifak EP2

GEAR OIL

Refer to the Tag Located on the Gear Reducer

HYDRAULIC OIL

(High Pressure, Anti-Wear/Anti-Foam Hydraulic Oil ISO Grade 32)

Manufacturer	Product
BP Amoco	Energol HLP-HM32
Gulf Oil Corp.	Harmony 32 AW
Kendall Refining Co.	Kenoil R&O AW-32
Lubriplate	HO-o
Mobil Oil Corp.	Mobil DTE 24
Pennzoil Products Co.	Pennzbell AW32
Shell Oil Co.	Tellus 32
Sun Refining	Survis 832
Texaco Inc.	Rando

WIRING

Refer to the repair parts list for the VE424MC or VE436MC for information regarding servicing the electrical hardware. In addition, the repair parts lists include the following information for the electrical assembly.

- Electrical schematic for 220/440-volt, 3-phase, 60-Hz service
- Electrical schematic for 380/400-volt, 3-phase, 50/60-Hz service
- Guidelines for possible supply-voltage conversions
- Thermal heater and fuse information for VE424MC or VE436MC tools that have been custom built for a specific supply voltage

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 the VE424MC or VE436MC for detailed drawings and parts listings.

1. Tool Model Number – VE424MC or VE436MC
2. Tool Series Number – The serial number can be found on the side of the tool on the nameplate (4M XXX)
3. Quantity, Part Number, and Description – For example, (1) R105424VE0, Upper Shaft
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

Order parts from Victaulic at the address listed in this manual.

ACCESSORIES

VAPS 112 VICTAULIC ADJUSTABLE PIPE STAND



The Victaulic VAPS 112 is a portable, adjustable, roller-type pipe stand that contains four legs for additional stability. Ball transfer rollers, adjustable for 2 - 12-inch pipe, and the "V" rest for $\frac{3}{4}$ - 1 $\frac{1}{2}$ -inch pipe accommodate linear and rotational movement. The turnstile design permits ease of grooving for both pipe ends. Contact Victaulic Tool Company for details.

VAPS 224 VICTAULIC ADJUSTABLE PIPE STAND



The Victaulic VAPS 224 contains features that are similar to the VAPS 112, but it is suitable for 2 - 24-inch/50 - 600-mm pipe sizes. Contact the Victaulic Tool Company for details.

VAPS 3036 VICTAULIC ADJUSTABLE
PIPE STAND



In addition, the Victaulic VAPS 3036 contains features that are similar for the VAPS 112, but it is suitable for 26 – 36-inch pipe sizes. Contact the Victaulic Tool Company for details.

OPTIONAL ROLLS

Refer to the applicable “Tool Rating and Roll Selection” section, which identifies rolls that are available for different pipe materials and groove specifications.

TROUBLESHOOTING

Problem	Possible Cause	Solution
Pipe will not stay in grooving rolls.	Incorrect pipe positioning of long pipe length. Lower roll and pipe are not rotating clockwise.	Refer to the "Long Pipe Lengths" section on page 12. Refer to the "Power Hookup" section on page 8.
Pipe stops rotating during the grooving operation.	Rust or dirt buildup is present on the lower roll. Rust or dirt is excessively heavy inside the pipe end. Worn grooving rolls. The key for the lower roll is sheared or missing. The circuit breaker has tripped or a fuse has blown out on the electrical circuit that supplies the tool.	Remove rust or dirt accumulation from the lower roll with a stiff wire brush. Remove heavy rust and dirt from inside the pipe end. Inspect the lower roll for worn knurls. Replace the lower roll if excessive wear is present. Remove the lower roll to replace the key. Refer to the "Roll Changing" section on page 25. Reset the breaker, or replace the fuse.
While grooving, loud squeaks echo through the pipe.	Incorrect pipe support positioning of a long pipe length. Pipe is "over-tracking." Pipe is not cut square. Pipe is rubbing excessively on the lower-roll backstop flange.	Move the pipe support to the right. Refer to the "Long Pipe Lengths" section on page 12. Cut the pipe end squarely. Remove the pipe from the tool, and apply a light coating of grease to the face of the lower-roll backstop flange, as needed.
During grooving, loud thumps or bangs occur approximately once every revolution of the pipe.	Pipe has a pronounced weld seam.	For pipe sizes up to 24-inch, raised internal and external weld beads and seams must be ground flush with the pipe surface 2 inches/50 mm back from the pipe ends. For 26 – 36-inch pipe sizes, 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. For 14 – 24-inch pipe grooved to AGS specifications, 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.

Problem	Possible Cause	Solution
Pipe flare is excessive.	Pipe support is adjusted too high for long pipe. Tool is tilted forward (out of level) while grooving long pipe. Incorrect pipe support positioning of long pipe. Pipe is "over-tracking." Pipe stabilizer is adjusted too far inward.	Refer to the "Long Pipe Lengths" section on page 12. Refer to the "Tool Setup" section on page 7. Move the pipe support to the right. Refer to the "Long Pipe Lengths" section on page 12. Back off the pipe stabilizer to the furthest point where it still stabilizes the pipe effectively.
Larger diameter pipe sway or vibrates from side to side.	Incorrect pipe stabilizer adjustment.	Move the pipe stabilizer in or out until the pipe rotates smoothly.
The tool will not groove the pipe.	Air is present in the hydraulic system. Pipe is beyond the wall thickness capacity of the tool.	Refer to the "Air Bleeding" section on page 48. Refer to the applicable "Tool Rating and Roll Selection" section.
Pipe grooves do not meet Victaulic specifications.	Groove diameter stop is not adjusted properly. Pipe is beyond the wall thickness capacity of the tool.	Refer to the "Groove Diameter Stop Adjustments" section on page 18. Refer to the applicable "Tool Rating and Roll Selection" section.
The "A" Gasket Seat or "B" Groove Width dimensions do not meet Victaulic specifications.	Upper roll bearing is not lubricated adequately. Incorrect upper roll, lower roll, or both installed on the tool.	Refer to the "Maintenance" section on page 44. Install the correct rolls. Refer to the applicable "Tool Rating and Roll Selection" section.

VE424MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM AND “ES” ROLLS FOR STEEL AND
SCHEDULE 40 STAINLESS STEEL PIPE – COLOR-CODED BLACK
(For 4 – 36-inch light-wall stainless steel pipe, refer to the table on page 58)

Pipe Size		1		2		Standard Roll Part Numbers	“ES” Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters					
		Steel Pipe Wall Thickness		Stainless Steel Pipe Wall Thickness			
		Minimum	Maximum	Minimum	Maximum		
4	4.500 114.3	0.083 2.1	0.375 9.5	0.237 6.0	0.237 6.0	Lower Roll R904424L06	Lower Roll RZ04424L06
4 ^{1/2}	5.000 127.0	0.095 2.4	0.375 9.5	0.237 6.0	0.237 6.0		
5	5.563 141.3	0.109 2.8	0.375 9.5	0.258 6.6	0.258 6.6	Upper Roll R904424U06	Upper Roll RZ04424U06
6	6.625 168.3	0.109 2.8	0.375 9.5	0.280 7.1	0.280 7.1		
8	8.625 219.1	0.109 2.8	0.375 9.5	0.250 6.4	0.322 8.2	Lower Roll R908424L12	Lower Roll RZ08424L12
10	10.750 273.0	0.134 3.4	0.375 9.5	0.250 6.4	0.365 9.3		
12	12.750 323.9	0.156 4.0	0.375 9.5	0.250 6.4	0.375 9.5	Upper Roll R908424U12	Upper Roll RZ08424U12
14 OD	14.000 355.6	0.156 4.0	0.375 9.5	0.312 7.9	0.375 9.5	Lower Roll R914424L16	–
16 OD	16.000 406.4	0.165 4.2	0.375 9.5	0.312 7.9	0.375 9.5	Upper Roll R914424U16	–
18 OD	18.000 457.0	0.165 4.2	0.375 9.5	0.375 9.5	0.375 9.5	Lower Roll R918424L20	–
20 OD	20.000 508.0	0.183 4.7	0.375 9.5	0.375 9.5	0.375 9.5	Upper Roll R918424U20	–
22 OD	22.000 559.0	0.188 4.8	0.375 9.5	0.375 9.5	0.375 9.5	Lower Roll R922424L24	–
24 OD	24.000 610.0	0.218 5.5	0.375 9.5	0.375 9.5	0.375 9.5	Upper Roll R922424U24	–
26 OD	26.000 660.0	0.250 6.4	0.375 9.5	0.375 9.5	0.375 9.5	Lower Roll R926424L36 Upper Roll R926424U36	– –
28 OD	28.000 711.0	0.250 6.4	0.375 9.5	0.375 9.5	0.375 9.5		
30 OD	30.000 762.0	0.250 6.4	0.375 9.5	0.375 9.5	0.375 9.5		
32 OD	32.000 813.0	0.250 6.4	0.375 9.5	0.375 9.5	0.375 9.5		
36 OD	36.000 914.0	0.250 6.4	0.375 9.5	0.375 9.5	0.375 9.5		

Notes:

Column 1: Maximum ratings on steel are limited to pipe of a Brinell Hardness Number (BHN) of 180 BHN and less

Column 2: Types 304/304L and 316/316L stainless steel pipe

The wall thicknesses listed are nominal minimum and maximum

In addition, the following pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 152.4 mm; 159.0 mm; 165.1 mm; 203.2 mm; 216.3 mm; 254.0 mm; 267.4 mm; 304.8mm; 318.5 mm; 377.0 mm; and 426.0 mm. Contact Victaulic Tool Company for details.

VE424MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM ROLLS FOR ALUMINUM
AND PVC PLASTIC PIPE – COLOR-CODED YELLOW ZINC

Pipe Size		1		2		RP Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters				
		Aluminum Pipe Wall Thickness		PVC Plastic Pipe Wall Thickness		
		Minimum	Maximum	Minimum	Maximum	
4	4.500 114.3	0.083 2.1	0.237 6.0	0.237 6.0	0.337 8.6	Lower Roll RP04424L06
4 ^{1/2}	5.000 127.0	0.095 2.4	0.237 6.0	- -	- -	
5	5.563 141.3	0.109 2.8	0.258 6.6	0.258 6.6	0.375 9.5	Upper Roll RP04424U06
6	6.625 168.3	0.109 2.8	0.280 7.1	0.280 7.1	0.432 11.0	
8	8.625 219.1	0.109 2.8	0.322 8.2	0.322 8.2	0.322 8.2	Lower Roll RP08424L12
10	10.750 273.0	0.134 3.4	0.250 6.4	- -	- -	Upper Roll RP08424U12
12	12.750 323.9	0.156 4.0	0.250 6.4	- -	- -	

Notes:

Column 1: Alloys 6061-T4 and 6063-T4

Column 2: PVC Type 1, Grade 1 – PVC 1120; PVC Type 1, Grade II – PVC 1220; PVC Type II, Grade 1 – PVC 2116

The wall thicknesses listed are nominal minimum and maximum

For aluminum pipe, the following, additional pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 152.4 mm; 159.0 mm; 165.1 mm; 203.2 mm; 216.3 mm; 254.0 mm; 267.4 mm; 304.8 mm; and 318.5 mm.

Contact Victaulic Tool Company for details.

For PVC pipe, the following, additional pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 159.0 mm; 165.1 mm; and 216.3 mm. Contact Victaulic Tool Company for details.

VE424MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM RX ROLLS FOR
SCHEDULE 5S AND 10S STAINLESS STEEL PIPE – COLOR-CODED SILVER

Pipe Size		Dimensions – inches/millimeters			RX Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Stainless Steel Pipe Wall Thickness			
		Minimum for Schedule 5S	Maximum for Schedule 10S	Maximum for Schedule 10	
4	4.500	0.083	0.120	–	Lower Roll RX04424L06
	114.3	2.1	3.1	–	
5	5.563	0.109	0.134	–	Upper Roll RX04424U06
	141.3	2.8	3.4	–	
6	6.625	0.109	0.134	–	Upper Roll RX04424U06
	168.3	2.8	3.4	–	
8	8.625	0.109	0.148	–	Lower Roll RX08424L12
	219.1	2.8	3.8	–	
10	10.750	0.134	0.165	–	Upper Roll RX08424U12
	273.0	3.1	4.2	–	
12	12.750	0.156	0.180	–	Upper Roll RX08424U12
	323.9	4.0	4.6	–	
14 OD	14.000	0.156	0.188	0.250	Lower Roll RX14424L16
	355.6	4.0	4.8	6.4	
16 OD	16.000	0.165	0.188	0.250	Upper Roll RX14424U16
	406.4	4.2	4.8	6.4	
18 OD	18.000	0.165	0.188	0.250	Lower Roll RX18424L20
	457.0	4.2	4.8	6.4	
20 OD	20.000	0.188	0.218	0.250	Upper Roll RX18424U20
	508.0	4.8	5.5	6.4	
22 OD	22.000	0.188	0.218	0.250	Lower Roll RX22424L24
	559.0	4.8	5.5	6.4	
24 OD	24.000	0.218	0.250	0.250	Upper Roll RX22424U24
	610.0	5.5	6.4	6.4	
26 OD	26.000	–	–	0.312	Lower Roll RX26424L36
	660.0	–	–	7.9	
28 OD	28.000	–	–	0.312	Upper Roll RX26424U36
	711.0	–	–	7.9	
30 OD	30.000	0.250	0.312	0.312	Upper Roll RX26424U36
	762.0	6.4	7.9	7.9	
32 OD	32.000	–	–	0.312	Upper Roll RX26424U36
	813.0	–	–	7.9	
36 OD	36.000	0.250	0.312	0.312	Upper Roll RX26424U36
	914.0	6.4	7.9	7.9	

Notes:

Types 304/304L and 316/316L stainless steel pipe
The wall thicknesses listed are nominal minimum and maximum

VE424MC TOOL RATING AND ROLL SELECTION

RW ROLLS FOR GROOVING STANDARD-WEIGHT STEEL PIPE TO AGS SPECIFICATIONS – COLOR-CODED BLACK WITH ORANGE BAND

RWX ROLLS FOR GROOVING SCHEDULE 5S AND 10S STAINLESS STEEL PIPE TO AGS SPECIFICATIONS – COLOR-CODED SILVER WITH BLACK BAND

Pipe Size		1		2		RW Roll Part Numbers for Standard-Weight Steel Pipe	RWX Roll Part Numbers for Schedule 5S and 10S Stainless Steel Pipe
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters					
		Standard-Weight Steel Pipe Wall Thickness		Schedule 5S and 10S Stainless Steel Pipe Wall Thickness			
		Minimum	Maximum	Schedule 5S	Schedule 10S ‡		
14 OD	14.000 355.6	0.375 9.5	0.375 9.5	0.156 4.0	0.188 4.8	Lower Roll RW14436L24	Lower Roll RWX1424L18
16 OD	16.000 406.4	0.375 9.5	0.375 9.5	0.165 4.2	0.188 4.8		Upper Roll RWX1424U24
18 OD	18.000 457.0	0.375 9.5	0.375 9.5	0.165 4.2	0.188 4.8	Upper Roll RW14436U24	Lower Roll RWX1424L24
20 OD	20.000 508.0	0.375 9.5	0.375 9.5	0.188 4.8	0.218 5.5		Upper Roll RWX1424U24
24 OD	24.000 610.0	0.375 9.5	0.375 9.5	0.218 5.5	0.250 6.4		Lower Roll RWX1424L24 Upper Roll RWX1424U24

Notes:

Column 1: Maximum ratings on steel are limited to pipe of a Brinell Hardness Number (BHN) of 180 BHN and less

Column 2: Types 304/304L and 316/316L stainless steel pipe

The wall thicknesses listed are nominal minimum and maximum

‡ The wall thicknesses listed in this column are for Schedule 10S stainless steel pipe. In addition, stainless steel pipe in 14 – 24-inch OD sizes is available in true Schedule 10, which has a nominal wall thickness of 0.250 inch/6.4 mm. For grooving 14 – 24-inch OD true Schedule 10 stainless steel pipe (nominal wall thickness of 0.250 inch/6.4 mm), the RWX1424L24 lower roll and the RWX1424U24 upper roll should be used.

VE436MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM ROLLS FOR STEEL AND SCHEDULE 40 STAIN-
LESS STEEL PIPE – COLOR-CODED BLACK

(For 4 – 36-inch light-wall stainless steel pipe, refer to the table on page 62)

Pipe Size		1		2		Standard Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters				
		Steel Pipe Wall Thickness ‡		Stainless Steel Pipe Wall Thickness		
		Minimum	Maximum	Minimum	Maximum	
4	4.500 114.3	0.083 2.1	0.375 9.5	0.237 6.0	0.237 6.0	Lower Roll R904436L06 Upper Roll R904436U06
4½	5.000 127.0	0.095 2.4	0.375 9.5	0.237 6.0	0.237 6.0	
5	5.563 141.3	0.109 2.8	0.375 9.5	0.258 6.6	0.258 6.6	
6	6.625 168.3	0.109 2.8	0.375 9.5	0.280 7.1	0.280 7.1	Lower Roll R908436L12 Upper Roll R908436U12
8	8.625 219.1	0.109 2.8	0.375 9.5	0.250 6.4	0.322 8.2	
10	10.750 273.0	0.134 3.4	0.375 9.5	0.250 6.4	0.365 9.3	
12	12.750 323.9	0.156 4.0	0.406 10.3	0.250 6.4	0.375 9.5	Lower Roll R914436L16 Upper Roll R914436U16
14 OD	14.000 355.6	0.156 4.0	0.438 11.1	0.312 7.9	0.375 9.5	
16 OD	16.000 406.4	0.165 4.2	0.500 12.7	0.312 7.9	0.375 9.5	
18 OD	18.000 457.0	0.165 4.2	0.500 12.7	0.375 9.5	0.375 9.5	Lower Roll R918436L20 Upper Roll R918436U20
20 OD	20.000 508.0	0.183 4.7	0.500 12.7	0.375 9.5	0.375 9.5	
22 OD	22.000 559.0	0.188 4.8	0.500 12.7	0.375 9.5	0.375 9.5	Lower Roll R922436L24 Upper Roll R922436U24
24 OD	24.000 610.0	0.218 5.5	0.500 12.7	0.375 9.5	0.375 9.5	
26 OD	26.000 660.0	0.250 6.4	0.500 12.7	0.375 9.5	0.375 9.5	Lower Roll R926424L36 Upper Roll R926436U36
28 OD	28.000 711.0	0.250 6.4	0.500 12.7	0.375 9.5	0.375 9.5	
30 OD	30.000 762.0	0.250 6.4	0.500 12.7	0.375 9.5	0.375 9.5	
32 OD	32.000 813.0	0.250 6.4	0.500 12.7	0.375 9.5	0.375 9.5	
36 OD	36.000 914.0	0.250 6.4	0.500 12.7	0.375 9.5	0.375 9.5	

Notes:

Column 1: Maximum ratings on steel are limited to pipe of a Brinell Hardness Number (BHN) of 180 BHN and less

Column 2: Types 304/304L and 316/316L stainless steel pipe

‡ The wall thicknesses listed are nominal minimum and maximum. For 6 – 14-inch sizes, special tooling is available for grooving extra-strong pipe. For 8 – 24-inch sizes, the maximum wall thickness is limited to standard wall for pipe lengths shorter than 4 feet/1.2 m.

In addition, the following pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 152.4 mm; 159.0 mm; 165.1 mm; 203.2 mm; 216.3 mm; 254.0 mm; 267.4 mm; 304.8mm; 318.5 mm; 377.0 mm; and 426.0 mm. Contact Victaulic Tool Company for details.

VE436MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM ROLLS FOR ALUMINUM
AND PVC PLASTIC PIPE – COLOR-CODED YELLOW ZINC

Pipe Size		1		2		RP Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters				
		Aluminum Pipe Wall Thickness		PVC Plastic Pipe Wall Thickness		
		Minimum	Maximum	Minimum	Maximum	
4	4.500 114.3	0.083 2.1	0.237 6.0	0.237 6.0	0.337 8.6	Lower Roll RP04436L06
4 ¹ / ₂	5.000 127.0	0.095 2.4	0.237 6.0	–	–	
5	5.563 141.3	0.109 2.8	0.258 6.6	0.258 6.6	0.375 9.5	
6	6.625 168.3	0.109 2.8	0.280 7.1	0.280 7.1	0.432 11.0	
8	8.625 219.1	0.109 2.8	0.322 8.2	0.322 8.2	0.322 8.2	Lower Roll RP08436L12
10	10.750 273.0	0.134 3.4	0.250 6.4	–	–	Upper Roll RP08436U12
12	12.750 323.9	0.156 4.0	0.250 6.4	–	–	

Notes:

Column 1: Alloys 6061-T4 and 6063-T4

Column 2: PVC Type 1, Grade 1 – PVC 1120; PVC Type 1, Grade II – PVC 1220; PVC Type II, Grade 1 – PVC 2116

The wall thicknesses listed are nominal minimum and maximum

For aluminum pipe, the following, additional pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 152.4 mm; 159.0 mm; 165.1 mm; 203.2 mm; 216.3 mm; 254.0 mm; 267.4 mm; 304.8 mm; and 318.5 mm.

Contact Victaulic Tool Company for details.

For PVC pipe, the following, additional pipe sizes may be roll grooved: 108.0 mm; 133.0 mm; 139.7 mm; 159.0 mm; 165.1 mm; and 216.3 mm. Contact Victaulic Tool Company for details.

VE436MC TOOL RATING AND ROLL SELECTION

ORIGINAL GROOVE SYSTEM RX ROLLS FOR
SCHEDULE 5S AND 10S STAINLESS STEEL PIPE – COLOR-CODED SILVER

Pipe Size		Dimensions – inches/millimeters			RX Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches/mm	Stainless Steel Pipe Wall Thickness			
		Minimum for Schedule 5S	Maximum for Schedule 10S	Maximum for Schedule 10	
4	4.500	0.083	0.120	–	Lower Roll RX04436L06
	114.3	2.1	3.1	–	
5	5.563	0.109	0.134	–	Upper Roll RX04436U06
	141.3	2.8	3.4	–	
6	6.625	0.109	0.134	–	Lower Roll RX08436L12
	168.3	2.8	3.4	–	
8	8.625	0.109	0.148	–	Upper Roll RX08436U12
	219.1	2.8	3.8	–	
10	10.750	0.134	0.165	–	Lower Roll RX14436L16
	273.0	3.1	4.2	–	
12	12.750	0.156	0.180	–	Upper Roll RX14436U16
	323.9	4.0	4.6	–	
14 OD	14.000	0.156	0.188	0.250	Lower Roll RX18436L20
	355.6	4.0	4.8	6.4	
16 OD	16.000	0.165	0.188	0.250	Upper Roll RX18436U20
	406.4	4.2	4.8	6.4	
18 OD	18.000	0.165	0.188	0.250	Lower Roll RX22436L24
	457.0	4.2	4.8	6.4	
20 OD	20.000	0.188	0.218	0.250	Upper Roll RX22436U24
	508.0	4.8	5.5	6.4	
22 OD	22.000	0.188	0.218	0.250	Lower Roll RX26424L36
	559.0	4.8	5.5	6.4	
24 OD	24.000	0.218	0.250	0.250	Upper Roll RX26424U36
	610.0	5.5	6.4	6.4	
26 OD	26.000	–	–	0.312	Lower Roll RX26424L36
	660.0	–	–	7.9	
28 OD	28.000	–	–	0.312	Upper Roll RX26436U36
	711.0	–	–	7.9	
30 OD	30.000	0.250	0.312	0.312	Lower Roll RX26436L36
	762.0	6.4	7.9	7.9	
32 OD	32.000	–	–	0.312	Upper Roll RX26436U36
	813.0	–	–	7.9	
36 OD	36.000	0.250	0.312	0.312	Lower Roll RX26436L36
	914.0	6.4	7.9	7.9	

Notes:

Types 304/304L and 316/316L stainless steel pipe
The wall thicknesses listed are nominal minimum and maximum

VE436MC TOOL RATING AND ROLL SELECTION

RW ROLLS FOR GROOVING STANDARD-WEIGHT STEEL PIPE TO AGS SPECIFICATIONS – COLOR-CODED BLACK WITH ORANGE BAND

RWX ROLLS TOR GROOVING SCHEDULE 5S AND 10S STAINLESS STEEL PIPE TO AGS SPECIFICATIONS – COLOR-CODED SILVER WITH BLACK BAND

Pipe Size		1		2		RW Roll Part Numbers for Standard-Weight Steel Pipe	RWX Roll Part Numbers for Schedule 5S and 10S Stainless Steel Pipe
Nominal Size inches	Actual Outside Diameter inches/mm	Dimensions – inches/millimeters					
		Standard-Weight Steel Pipe Wall Thickness		Schedule 5S and 10S Stainless Steel Pipe Wall Thickness			
		Minimum	Maximum	Schedule 5S	Schedule 10S ‡		
14 OD	14.000 355.6	0.375 9.5	0.375 9.5	0.156 4.0	0.188 4.8	Lower Roll RW14436L24	Lower Roll RWX1424L18 Upper Roll RWX1424U24
16 OD	16.000 406.4	0.375 9.5	0.375 9.5	0.165 4.2	0.188 4.8		
18 OD	18.000 457.0	0.375 9.5	0.375 9.5	0.165 4.2	0.188 4.8		
20 OD	20.000 508.0	0.375 9.5	0.375 9.5	0.188 4.8	0.218 5.5	Upper Roll RW14436U24	Lower Roll RWX1424L24 Upper Roll RWX1424U24
24 OD	24.000 610.0	0.375 9.5	0.375 9.5	0.218 5.5	0.250 6.4		

Notes:

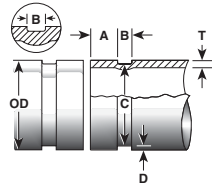
Column 1: Maximum ratings on steel are limited to pipe of a Brinell Hardness Number (BHN) of 180 BHN and less

Column 2: Types 304/304L and 316/316L stainless steel pipe

The wall thicknesses listed are nominal minimum and maximum

‡ The wall thicknesses listed in this column are for Schedule 10S stainless steel pipe. In addition, stainless steel pipe in 14 – 24-inch OD sizes is available in true Schedule 10, which has a nominal wall thickness of 0.250 inch/6.4 mm. For grooving 14 – 24-inch OD true Schedule 10 stainless steel pipe (nominal wall thickness of 0.250 inch/6.4 mm), the RWX1424L24 lower roll and the RWX1424U24 upper roll should be used.

EXPLANATION OF CRITICAL ROLL GROOVE DIMENSIONS



Exaggerated for clarity

Standard (Original) Roll Groove

Outside Diameter (“OD”) Dimension – The outside diameter of roll grooved pipe must not vary from the specifications listed in the following tables. The maximum allowable tolerance from square-cut pipe ends is 0.045 inch/1.1 mm for 4 – 6-inch sizes and 0.060 inch/1.5 mm for 8-inch and larger sizes. 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, and roll marks from the pipe end to the groove to provide a leak-tight seal for the gasket.

“B” Dimension – The “B” dimension, or groove width, controls expansion and angular deflection by the distance it is located from the pipe and its width in relation to the housings’ “key” width.

“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.

“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.

“F” Dimension (Standard [Original] Roll Groove Only) – Maximum allowable pipe-end flare diameter is measured at the extreme pipe-end diameter.

“T” Dimension – The “T” dimension is the lightest grade (minimum, nominal wall thickness) of pipe that is suitable for roll grooving (except for PVC pipe).

ROLL GROOVE SPECIFICATIONS

ORIGINAL SYSTEM GROOVES FOR STEEL, STAINLESS STEEL, ALUMINUM, AND PVC PIPE

Pipe Size			Dimensions – inches/millimeters											
Nom. Size Inches or mm	Actual OD Inches/mm	Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
		Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.			
108.0 mm	4.250 108.0	4.293	4.219	0.625	0.656	0.594	0.344	0.375	0.313	4.084	4.064	0.083	0.078	4.35
		109.0	107.2	15.9	16.7	15.1	8.7	9.5	8.0	103.7	103.2	2.2	2.0	110.5
4	4.500 114.3	4.545	4.469	0.625	0.656	0.594	0.344	0.375	0.313	4.334	4.314	0.083	0.078	4.60
		115.4	113.5	15.9	16.7	15.1	8.7	9.5	8.0	110.1	109.6	2.2	2.0	116.8
4 1/2	5.000 127.0	5.050	4.969	0.625	0.656	0.594	0.344	0.375	0.313	4.834	4.814	0.083	0.078	5.10
		128.3	126.2	15.9	16.7	15.1	8.7	9.5	8.0	122.8	122.3	2.2	2.0	129.5
133.0 mm	5.250 133.0	5.303	5.219	0.625	0.656	0.594	0.344	0.375	0.313	5.084	5.064	0.083	0.078	5.35
		134.7	132.6	15.9	16.7	15.1	8.7	9.5	8.0	129.1	128.6	2.2	2.0	135.9
139.7 mm	5.500 139.7	5.556	5.469	0.625	0.656	0.594	0.344	0.375	0.313	5.334	5.314	0.083	0.078	5.60
		141.1	138.9	15.9	16.7	15.1	8.7	9.5	8.0	135.5	135.0	2.2	2.0	142.2
5	5.563 141.3	5.619	5.532	0.625	0.656	0.594	0.344	0.375	0.313	5.395	5.373	0.084	0.078	5.66
		142.7	140.5	15.9	16.7	15.1	8.7	9.5	8.0	137.0	136.5	2.2	2.0	143.8
152.4 mm	6.000 152.4	6.056	5.969	0.625	0.656	0.594	0.344	0.375	0.313	5.830	5.808	0.085	0.078	6.10
		153.8	151.6	15.9	16.7	15.1	8.7	9.5	8.0	148.1	147.5	2.2	2.0	154.9
159.0 mm	6.250 159.0	6.313	6.219	0.625	0.656	0.594	0.344	0.375	0.313	6.032	6.002	0.109	0.109	6.35
		160.4	158.0	15.9	16.7	15.1	8.7	9.5	8.0	153.2	152.5	2.8	2.8	161.3
165.1 mm	6.500 165.1	6.563	6.469	0.625	0.656	0.594	0.344	0.375	0.313	6.330	6.308	0.085	0.078	6.60
		166.7	164.3	15.9	16.7	15.1	8.7	9.5	8.0	160.8	160.2	2.2	2.8	167.6
6	6.625 168.3	6.688	6.594	0.625	0.656	0.594	0.344	0.375	0.313	6.455	6.433	0.085	0.078	6.73
		169.9	167.5	15.9	16.7	15.1	8.7	9.5	8.0	164.0	163.4	2.2	2.8	170.9
203.2 mm	8.000 203.2	8.063	7.969	0.750	0.781	0.719	0.469	0.500	0.438	7.816	7.791	0.092	0.109	8.17
		204.8	202.4	19.1	19.8	18.3	11.9	12.7	11.1	198.5	197.9	2.4	2.8	207.5
216.3 mm	8.515 216.3	8.578	8.484	0.750	0.781	0.719	0.469	0.500	0.438	8.331	8.306	0.092	0.109	8.69
		217.9	215.5	19.1	19.8	18.3	11.9	12.7	11.1	211.6	211.0	2.4	2.8	220.7
8	8.625 219.1	8.688	8.594	0.750	0.781	0.719	0.469	0.500	0.438	8.441	8.416	0.092	0.109	8.80
		220.7	218.3	19.1	19.8	18.3	11.9	12.7	11.1	214.4	213.8	2.4	2.8	223.5
254.0 mm	10.000 254.0	10.063	9.969	0.750	0.781	0.719	0.469	0.500	0.438	9.812	9.785	0.094	0.134	10.17
		255.6	253.2	19.1	19.8	18.3	11.9	12.7	11.1	249.2	248.5	2.4	3.4	258.3

66 ROLL GROOVE SPECIFICATIONS

ORIGINAL SYSTEM GROOVES FOR STEEL, STAINLESS STEEL, ALUMINUM, AND PVC PIPE

Pipe Size		Dimensions – inches/millimeters												
Nom. Size inches or mm	Actual OD inches/mm	Pipe Outside Diameter		Gasket Seat "A"		Groove Width "B"				Groove Diameter "C"		Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
		Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.			
267.4 mm	10.528	10.591	10.497	0.750	0.781	0.719	0.469	0.500	0.438	10.340	10.313	0.094	0.134	10.70
	267.4	269.0	266.6	19.1	19.8	18.3	11.9	12.7	11.1	262.6	262.0	2.4	3.4	271.8
10	10.750	10.813	10.719	0.750	0.781	0.719	0.469	0.500	0.438	10.562	10.535	0.094	0.134	10.92
	273.0	274.7	272.3	19.1	19.8	18.3	11.9	12.7	11.1	268.3	267.6	2.4	3.4	277.4
304.8 mm	12.000	12.063	11.969	0.750	0.781	0.719	0.469	0.500	0.438	11.781	11.751	0.109	0.156	12.17
	304.8	306.4	304.0	19.1	19.8	18.3	11.9	12.7	11.1	299.2	298.5	2.8	4.0	309.1
318.5 mm	12.539	12.602	12.508	0.750	0.781	0.719	0.469	0.500	0.438	12.321	12.291	0.109	0.156	12.71
	318.5	320.1	317.7	19.1	19.8	18.3	11.9	12.7	11.1	313.0	312.2	2.8	4.0	322.8
12	12.750	12.813	12.719	0.750	0.781	0.719	0.469	0.500	0.438	12.531	12.501	0.109	0.156	12.92
	323.9	325.5	323.1	19.1	19.8	18.3	11.9	12.7	11.1	318.3	317.5	2.8	4.0	328.2
14 OD	14.000	14.063	13.969	0.938	0.969	0.907	0.469	0.500	0.438	13.781	13.751	0.109	0.156	14.16
	355.6	357.2	354.8	23.8	24.6	23.0	11.9	12.7	11.1	350.0	349.3	2.8	4.0	359.7
377.0 mm	14.843	14.937	14.811	0.938	0.969	0.907	0.469	0.500	0.438	14.611	14.581	0.116	0.177	15.00
	377.0	379.4	376.2	23.8	24.6	23.0	11.9	12.7	11.1	371.1	370.4	2.9	4.5	381.0
15 OD	15.000	15.063	14.969	0.938	0.969	0.907	0.469	0.500	0.438	14.781	14.751	0.109	0.165	15.16
	381.0	382.6	380.2	23.8	24.6	23.0	11.9	12.7	11.1	375.4	374.7	2.8	4.2	385.1
16 OD	16.000	16.063	15.969	0.938	0.969	0.907	0.469	0.500	0.438	15.781	15.751	0.109	0.165	16.16
	406.4	408.0	405.6	23.8	24.6	23.0	11.9	12.7	11.1	400.8	400.1	2.8	4.2	410.5
426.0 mm	16.772	16.866	16.740	0.938	0.969	0.907	0.469	0.500	0.438	16.514	16.479	0.129	0.177	16.93
	426.0	428.4	425.2	23.8	24.6	23.0	11.9	12.7	11.1	419.5	418.6	3.3	4.5	430.0
18 OD	18.000	18.063	17.969	1.000	1.031	0.969	0.469	0.500	0.438	17.781	17.751	0.109	0.165	18.16
	457.0	458.8	456.4	25.4	26.2	24.6	11.9	12.7	11.1	451.6	450.9	2.8	4.2	461.1
20 OD	20.000	20.063	19.969	1.000	1.031	0.969	0.469	0.500	0.438	19.781	19.751	0.109	0.188	20.16
	508.0	509.6	507.2	25.4	26.2	24.6	11.9	12.7	11.1	502.4	501.7	2.8	4.8	512.1
22 OD	22.000	22.063	21.969	1.000	1.031	0.969	0.500	0.531	0.469	21.656	21.626	0.172	0.188	22.20
	559.0	560.4	558.0	25.4	26.2	24.6	12.7	13.5	11.9	550.1	549.3	4.4	4.8	563.9
24 OD	24.000	24.063	23.969	1.000	1.031	0.969	0.500	0.531	0.469	23.656	23.626	0.172	0.218	24.20
	610.0	611.2	608.8	25.4	26.2	24.6	12.7	13.5	11.9	600.9	600.1	4.4	5.5	614.7

ROLL GROOVE SPECIFICATIONS

ORIGINAL SYSTEM GROOVES FOR STEEL, STAINLESS STEEL, ALUMINUM, AND PVC PIPE

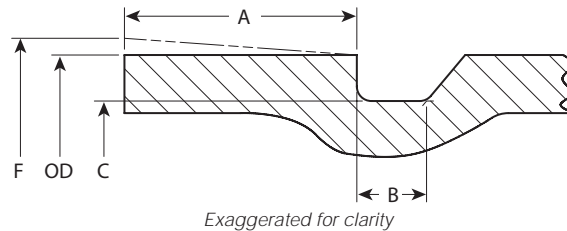
Pipe Size		Dimensions – inches/millimeters														
		Pipe Outside Diameter			Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"			Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
Nom. Size inches or mm	Actual OD inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.			
26 OD	26.000	26.093	25.969	1.750	1.781	1.687	0.625	0.656	0.594	0.625	0.656	0.594	25.500	25.437	0.250	26.20
	660.0	662.8	659.6	44.5	45.2	42.8	15.9	16.7	15.1	15.9	16.7	15.1	647.7	646.1	6.4	665.5
28 OD	28.000	28.093	27.969	1.750	1.781	1.687	0.625	0.656	0.594	0.625	0.656	0.594	27.500	27.437	0.250	28.20
	711.0	713.6	710.4	44.5	45.2	42.8	15.9	16.7	15.1	15.9	16.7	15.1	698.5	696.9	6.4	716.3
30 OD	30.000	30.093	29.969	1.750	1.781	1.687	0.625	0.656	0.594	0.625	0.656	0.594	29.500	29.437	0.250	30.20
	762.0	764.4	761.2	44.5	45.2	42.8	15.9	16.7	15.1	15.9	16.7	15.1	749.3	747.7	6.4	767.1
32 OD	32.000	32.093	31.969	1.750	1.781	1.687	0.625	0.656	0.594	0.625	0.656	0.594	31.500	31.437	0.250	32.20
	813.0	815.2	812.0	44.5	45.2	42.8	15.9	16.7	15.1	15.9	16.7	15.1	800.1	798.5	6.4	817.9
36 OD	36.000	36.093	35.969	1.750	1.781	1.687	0.625	0.656	0.594	0.625	0.656	0.594	35.500	35.437	0.250	36.20
	914.0	916.8	913.6	44.5	45.2	42.8	15.9	16.7	15.1	15.9	16.7	15.1	901.7	900.1	6.4	919.5

STEEL PIPE AND ALL MATERIALS GROOVED WITH "ES" ROLLS

Pipe Size		Dimensions – inches/millimeters													
		Pipe Outside Diameter			Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"			Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T"
Nominal Size inches	Actual Outside Diameter inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.		
4	4.500	4.545	4.469	0.610	0.590	0.590	0.320	0.300	0.300	0.320	0.300	4.334	4.314	0.083	4.600
	114.3	115.4	113.5	15.5	15.0	15.0	8.1	7.6	7.6	8.1	7.6	110.1	109.6	2.1	116.8
6	6.625	6.688	6.594	0.610	0.590	0.590	0.320	0.300	0.300	0.320	0.300	6.455	6.433	0.085	6.730
	168.3	169.9	167.5	15.5	15.0	15.0	8.1	7.6	7.6	8.1	7.6	164.0	163.4	2.2	170.9
8	8.625	8.688	8.594	0.719	0.699	0.699	0.410	0.390	0.390	0.410	0.390	8.441	8.416	0.092	8.800
	219.1	220.7	218.3	18.3	17.8	17.8	10.4	9.9	9.9	10.4	9.9	214.4	213.8	2.3	223.5
10	10.750	10.813	10.719	0.719	0.699	0.699	0.410	0.390	0.390	0.410	0.390	10.562	10.535	0.094	10.920
	273.0	274.7	272.3	18.3	17.8	17.8	10.4	9.9	9.9	10.4	9.9	268.3	267.6	2.4	277.4
12	12.750	12.813	12.719	0.719	0.699	0.699	0.410	0.390	0.390	0.410	0.390	12.531	12.501	0.109	12.920
	323.9	325.5	323.1	18.3	17.8	17.8	10.4	9.9	9.9	10.4	9.9	318.3	317.5	2.8	328.2

NOTICE

- Grooving pipe to Advanced Groove System (AGS) specifications enlarges the pipe length by approximately $\frac{1}{8}$ inch (0.125 inch/3.2 mm) for each groove. For a pipe length with an AGS groove at each end, the length will grow approximately $\frac{1}{4}$ inch (0.250 inch/6.4 mm) total. Therefore, the cut length should be adjusted to accommodate this growth. **EXAMPLE:** If you need a 24-inch/610 mm length of pipe that will contain an AGS groove at each end, cut the pipe to a length of $23\frac{3}{4}$ inches/603 mm to allow for this growth.
- It is critical to measure the Groove Diameter "C" dimension, along with the Gasket Seat "A" dimension and the Flare Diameter "F" dimension. These measurements must be within the specifications listed in the tables below for proper joint performance.



Advanced Groove System (AGS) Roll Groove

ADVANCED GROOVE SYSTEM (AGS) ROLL GROOVING SPECIFICATIONS FOR CARBON STEEL PIPE

Pipe Size	Dimensions - inches/millimeters										
	Outside Diameter "OD"		Gasket Seat "A"			Groove Width "B" ‡			Groove Diameter "C"		Max. Allow. Flare Dia. "F"
	Actual	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	
14 355.6	14.094 358.0	13.969 354.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	13.500 342.9	13.455 341.8	14.23 361.4
16 406.4	16.094 408.8	15.969 405.6	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	15.500 393.7	15.455 392.6	16.23 412.2
18 457.0	18.094 459.6	17.969 456.4	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	17.500 444.5	17.455 443.4	18.23 463.0
20 508.0	20.094 510.4	19.969 507.2	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	19.500 495.3	19.455 494.2	20.23 513.8
24 610.0	24.094 612.0	23.969 608.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	23.500 596.9	23.455 595.8	24.23 615.4

‡ The Groove Width "B" dimension is listed for information only. The Groove Width "B" dimension will be achieved with properly maintained Victaulic tools that are equipped with special Victaulic AGS (RW) roll sets made specifically for use with standard-weight pipe.

ADVANCED GROOVE SYSTEM (AGS) ROLL GROOVING SPECIFICATIONS FOR STAINLESS STEEL PIPE

Pipe Size		Dimensions - inches/millimeters									
Nom. Size inches/ Actual mm	Outside Diameter "OD"		Gasket Seat "A"			Groove Width "B" ‡			Groove Diameter "C"		Max. Allow. Flare Dia. "F"
	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	
14 355.6	14.094 358.0	13.969 354.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	13.500 342.9	13.455 341.8	14.23 361.4
16 406.4	16.094 408.8	15.969 405.6	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	15.500 393.7	15.455 392.6	16.23 412.2
18 457.0	18.094 459.6	17.969 456.4	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	17.500 444.5	17.455 443.4	18.23 463.0
20 508.0	20.125 511.2	19.969 507.2	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	19.500 495.3	19.455 494.2	20.23 513.8
24 610.0	24.125 612.8	23.969 608.8	1.500 38.1	1.531 38.9	1.437 36.5	0.455 11.6	0.460 11.7	0.450 11.4	23.500 596.9	23.455 595.8	24.23 615.4

‡ The Groove Width "B" dimension is listed for information only. The Groove Width "B" dimension will be achieved with properly maintained Victaulic tools that are equipped with special Victaulic AGS (RWX) roll sets made specifically for use with stainless steel pipe.

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