



## Operating and Maintenance Instructions Manual

# VE106 Groove-N-Go

## Portable Pipe/Tubing Roll Grooving Tool



Patented

### **WARNING**



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

- Before operating or servicing the VE106 Groove-N-Go 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 Tool Company, P.O. Box 31, Easton, PA 18044-0031, Phone: 1-800-PICK VIC, e-mail: [pickvic@victaulic.com](mailto: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**

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The VE106 Groove-N-Go tool is designed only for roll grooving pipe/tubing. Use of this tool requires dexterity and mechanical skills, as well as sound safety habits. Although this tool is designed for safe, dependable operation, it is impossible to anticipate all the combinations of circumstances that could result in an accident. The following instructions are recommended for safe operation of this tool. 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 this tool to ensure that all operators read this manual and fully understand the operation of this tool.

Read this manual before operating or servicing this tool. 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. This tool is designed ONLY for roll grooving pipe/tubing sizes, materials, and wall thicknesses listed in the "Tool Rating and Roll Selection" section, starting on page 28.**

**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 drive motor to protect the operator from electric shock.** Make sure the drive motor is connected to an internally grounded electrical source.

**4. Prevent back injury.** This tool is heavy. When removing from or placing into a truck or van, two people can lift the tool more safely and faster than one.

**5. Inspect the equipment.** Before using the tool, check all moveable parts for any obstructions. Make sure tool components are installed and adjusted properly.

**6. Prevent accidental startups.** Be careful not to depress the safety foot switch unintentionally.

**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. When using this tool on an elevated floor or platform, the area below must remain clear of other personnel.**

**12. 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.

**13. Secure the work, machine, and accessories.** Make sure the tool is stable. Refer to the "Tool Setup" section on page 6.

**14. Support the work.** Support long pipe/tubing lengths with a pipe stand that is secured to the floor or the ground.

**15. Operate the tool only with a safety foot switch.** The drive motor 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 Victaulic.

**16. Keep hands and tools away from grooving rolls during the grooving operation.** Grooving rolls can crush or cut fingers and hands.

**17. Do not reach inside the pipe/tubing end during tool operation.**

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

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

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

**21. Disconnect the power cord from the electrical source before servicing the tool.** Only authorized personnel should attempt to perform maintenance on the tool. Always disconnect the power cord from the electrical source 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. When tools are not in use, store them in a dry, secure place.**

**24. 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" and "Accessories" sections on page 25.

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

## INTRODUCTION

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### 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 Victaulic VE106 Groove-N-Go tool is a very portable, semi-automated, manual-feed tool for roll grooving pipe/tubing to receive Victaulic grooved pipe/tubing products. The standard VE106 Groove-N-Go tool is supplied with grooving rolls for 1 $\frac{1}{4}$  - 6-inch carbon steel pipe. Rolls are marked with the size and part number, and they are color coded to identify the pipe material. For roll grooving to other Victaulic specifications and materials, refer to the "Tool Rating and Roll Selection" section on page 28. Grooving rolls for other specifications, sizes, and materials must be purchased separately.

### CAUTION

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

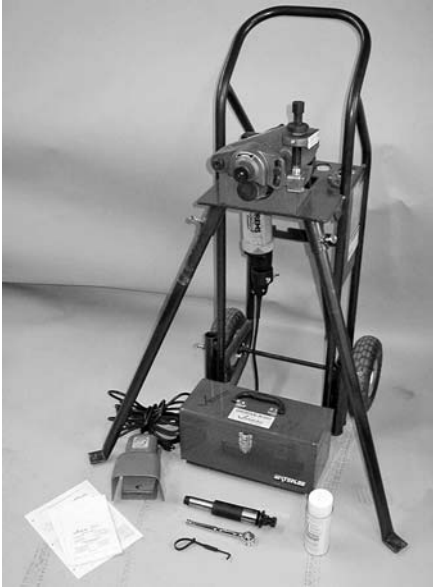
**Failure to follow this instruction could overload the tool, resulting in reduced tool life and/or damage to the tool.**

## RECEIVING THE TOOL

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VE106 Groove-N-Go tools are packed individually in sturdy containers. Upon receipt of the tool, make sure all necessary parts are included. If any parts are missing, contact the Victaulic Tool Company.

## VE106 GROOVE-N-GO CONTAINER CONTENTS



Qty.	Description
1	Tool Head Assembly with Cart
3	Adjustable Legs (Secured in Leg Storage Tubes of Cart)
1	Lower Roll/Main Shaft for 1 $\frac{1}{4}$ - 3-inch Carbon Steel Pipe *
1	Safety-Foot-Switch Storage Box
1	Safety Foot Switch (Located Inside Storage Box)
2	Operating and Maintenance Instructions Manual
1	VE106 Groove-N-Go Repair Parts List
1	$\frac{3}{8}$ -inch Square-Drive Ratchet (10 inches Long)
-	Spare Shear Pins
-	Depth Gauges for 1 $\frac{1}{4}$ - 6-inch Schedule 5, Schedule 10, and Schedule 40 Carbon Steel Pipe
1	$\frac{3}{16}$ -inch Hex Key Allen Wrench
1	Go/No-Go Pipe Tape
1	11 oz. can of Dow Corning G-n Mechanical Assembly Spray

\* The lower roll/main shaft for 4 – 6-inch carbon steel pipe is installed in the head assembly

**NOTE:** Optional items, such as roll sets for grooving stainless steel pipe and copper tubing, may be shipped separately.

## POWER REQUIREMENTS

### **⚠ DANGER**



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

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

Power must be supplied to the drive motor through a safety foot switch to ensure safe operation. Make sure the drive motor is grounded properly in accordance with Article 250 of the National Electrical Code.

If an extension cord is required, refer to the “Extension Cord Requirements” section below for cord sizes.

### EXTENSION CORD REQUIREMENTS

When pre-wired outlets are not available and an extension cord must be used, it is important to use the proper cord size (i.e. Conductor Size American Wire Gauge). Cord size selection is based upon tool rating (amps) and cord length (feet). Cord sizes (gauges) thinner than required will cause significant voltage drop at the drive motor while the tool is operating. Voltage drops may cause damage to the drive motor and can result in improper tool operation. **NOTE:** It is acceptable to use a heavier cord size (gauge) than what is required.

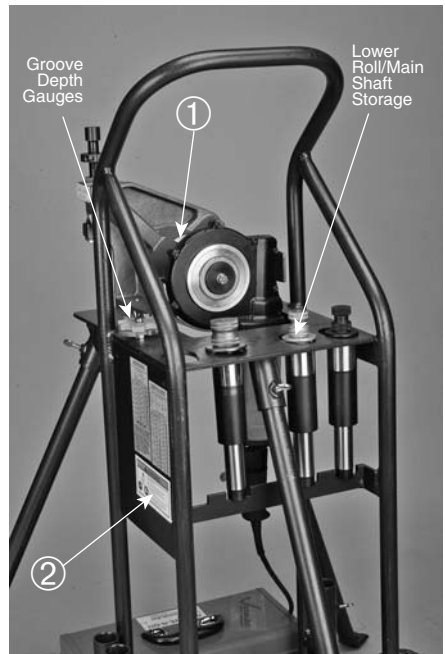
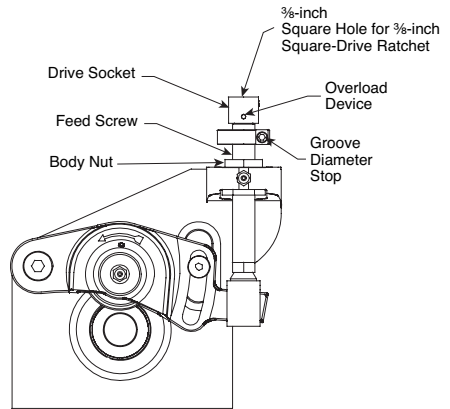
The required cord sizes (gauges) for cord lengths up to and including 100 feet (30 m) are listed in the table below. Use of extension cords longer than 100 feet (30 m) must be avoided.

Drive Motor Rating Volts (Amps)	Cord Lengths		
	25 feet (8 m)	50 feet (15 m)	100 feet (31 m)
110 (12)	12 gauge	12 gauge	10 gauge
220 (6)	14 gauge	12 gauge	10 gauge

# 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.



①

<b>⚠ WARNING</b>	
	<p>Failure to follow instructions and warnings can result in serious injury.</p> <ul style="list-style-type: none"> <li>• Before installing, operating, or servicing this tool, read and understand the Operating Instructions and all warning labels on this tool.</li> </ul>
<p>• Always wear safety glasses and foot protection.</p> <p><small>If you have any questions about the safe operation of this tool, contact Victaulic Tool Company, P.O. Box 31, Easton, PA 18044-0031, 610-559-3300. 1032 Rev. A</small></p>	

②

<b>⚠ WARNING</b>	
	<p>Failure to follow instructions and warnings can result in serious injury, property damage, or faulty installation.</p> <ul style="list-style-type: none"> <li>• Before installing, operating, or servicing this tool, read and understand the Operating Instructions and all warning labels on this tool.</li> </ul>
	<p>• Always wear safety glasses and foot protection.</p> <p><small>If you have any questions about the safe operation of this tool, contact Victaulic Tool Company, P.O. Box 31, Easton, PA 18044-0031, 610-559-3300.</small></p>

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# TOOL SETUP

## ⚠ WARNING

- **DO NOT connect the tool to the electrical source until instructed otherwise.**  
Accidental startup of the tool could result in serious personal injury.

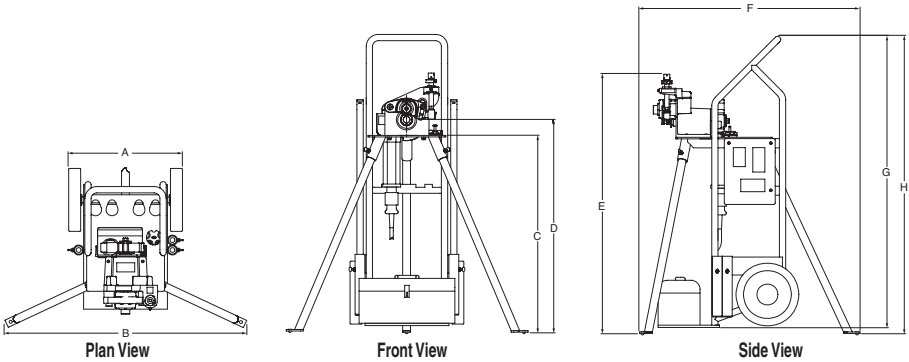
The standard VE106 Groove-N-Go tool is intended for field or shop setup. Before grooving, the adjustable legs must be mounted onto the tool.

**1.** Remove all components from the packaging, and make sure all necessary items are

included. Refer to the "Receiving the Tool" section on page 3.

**2.** Select a location for the tool by taking into consideration the following factors (refer to the drawing below for overall dimensions):

- 2a.** The required power supply (verify the voltage of the drive motor [110 volt or 220 volt])
- 2b.** Adequate space to handle pipe/tubing lengths
- 2c.** A firm and level surface for the tool and pipe stand
- 2d.** Adequate clearance around the tool for adjustment and maintenance



Dimensions – inches (millimeters)								Tool Weight
A	B	C	D	E *	F	G	H	lbs/kg
22.00 (558,8)	39.50 (1003,3)	32.25 (819,2)	35.00 (889,0)	45.00 (1143,0)	40.50 (1028,7)	48.75 (1238,3)	49.00 (1244,6)	162 73,5

\* "E" dimension reflects maximum ram extension.

## ⚠ WARNING

- **DO NOT lift the tool into the vertical (upright) position until the two front legs are installed.**
  - **The tool will be top heavy until the third leg is installed on the tool. Use caution to prevent the tool from tipping over.**
- Failure to follow these instructions could result in serious personal injury.



**3.** Make sure the tool is secure and in the horizontal position (lying down) with the handle of the cart resting against the ground or floor, as shown above.





**4.** Remove the legs from the leg storage tubes. Install the two front legs by inserting them into the sockets located on the underside of the tool head table. Make sure each leg seats properly in the sockets. Rotate the legs so that each foot points away from the tool. Using a  $\frac{1}{2}$ -inch wrench, tighten each  $\frac{5}{16}$  – 18 hex bolt to secure the legs to the tool.



**5.** Make sure the front legs are securely fastened in the sockets. Lift/tilt the tool into the vertical (upright) position, as shown above.

VE106 Groove-N-Go Tool



**6.** With the tool in the vertical (upright) position, install the third leg into the socket adjacent to the drive motor. Rotate the leg so that the foot points away from the tool. Using a  $\frac{1}{2}$ -inch wrench, tighten the  $\frac{5}{16}$  – 18 hex bolt to secure the leg to the tool.



**7.** Level the tool from front to back. **NOTE:** The top of the tool head table is a good location to measure “level,” as shown above. If the tool is not level, proceed with 7a.



**7a.** Loosen the hex bolts to adjust the legs in or out, as required, to make the tool level. Re-tighten all hex bolts after leveling the tool. Do not extend any of the legs past the hex bolt. If this cannot be accomplished, move the tool to a more level surface, and repeat this step until the tool is level.

**⚠ DANGER**



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

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

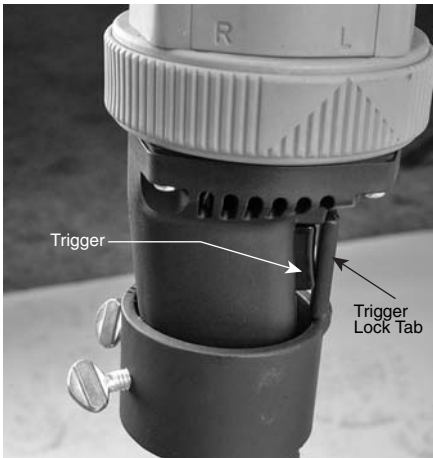


**8a.** Tighten the two trigger-lock switch thumb screws to maintain this position.

**⚠ WARNING**

- DO NOT operate the drive motor without a safety foot switch. If the tool does not contain a safety foot switch, contact the Victaulic Tool Company.

Operating the tool without a safety foot switch could result in serious personal injury.



**8.** Make sure the drive-motor trigger switch is depressed in the proper location. The trigger lock tab must push down on the drive-motor trigger switch.



**9.** Remove the safety foot switch from the storage box.

**9a.** Plug the cord for the safety foot switch into a grounded electrical outlet. Refer to the "Power Requirements" section on page 4. If an extension cord is used, refer to the "Extension Cord Requirements" section on page 4 for requirements.



**10.** Rotate the drive motor switch to the "L" position to produce **COUNTERCLOCKWISE** rotation of the lower roll/main shaft and pipe/tubing, as shown above.

**11.** Depress the safety foot switch, check the rotation of the lower roll/main shaft, and make sure the tool is stable. If rotation is clockwise, rotate the drive-motor switch to the opposite position. If the tool wobbles, make sure the legs are adjusted correctly and that the tool is level on the floor. If the wobble persists, re-adjust the legs.

**VE106 GROOVE-N-GO TOOL SETUP IS NOW COMPLETE.**

## 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

- Before making any tool adjustments, always disconnect the power cord from the electrical source.

Accidental startup of the tool 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/tubing size, part number, and they are color coded for the pipe/tubing material. Refer to the "Tool Rating and Roll Selection" section, starting on page 28. If the proper rolls are not installed on the tool, refer to the "Roll Changing" section on page 19.

### PIPE/TUBING 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/tubing for use with grooved-end pipe/tubing products. Square-cut pipe/tubing **MUST** be used with FlushSeal® and EndSeal® gaskets. Beveled-end pipe/tubing may be used, 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/tubing may result in unacceptable flare.
- 2.** Raised internal and external weld beads and seams must be ground flush with the pipe/tubing surface 2 inches (50 mm) back from the pipe/tubing ends.

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

### CAUTION

- For maximum grooving roll life, remove foreign material and loose rust from the interior and exterior surfaces of the pipe/tubing ends. Rust is an abrasive material that will wear the surface of grooving rolls.
- Foreign material may interfere with or damage grooving rolls, resulting in distorted grooves and grooves that are out of Victaulic specifications.

## PIPE/TUBING LENGTHS SUITABLE FOR GROOVING

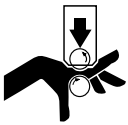
The VE106 Groove-N-Go tool is capable of grooving short pipe/tubing lengths without the use of a pipe stand. Refer to the "Short Pipe/Tubing Lengths" section on this page.

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

Pipe/tubing 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/TUBING LENGTHS

### WARNING



- Grooving rolls can crush or cut fingers and hands.
- Never groove pipe/tubing that is shorter than the recommended lengths listed in this manual.

Table 1 shows the minimum and maximum pipe/tubing lengths that can be grooved without the use of a pipe stand. Refer to the "Grooving Operation" section, starting on page 15, for instructions on how to groove short pipe/tubing lengths. For pipe/tubing longer than what is shown in Table 1, refer to the "Long Pipe/Tubing Lengths" section on page 11.

## NOTICE

- Grooved pipe/tubing nipples, shorter than those listed in Table 1, are available from Victaulic.

**TABLE 1 – PIPE/TUBING LENGTHS SUITABLE FOR GROOVING**

Steel and Stainless Steel Pipe Size		Length – inches (mm)	
Nominal Pipe Size inches or mm	Actual Outside Diameter inches (mm)	Minimum	Maximum
1 <sup>1</sup> / <sub>4</sub>	1.660 42,4	8 205	36 915
1 <sup>1</sup> / <sub>2</sub>	1.900 48,3	8 205	36 915
2	2,375 60,3	8 205	36 915
2 <sup>1</sup> / <sub>2</sub>	2,875 73,0	8 205	36 915
3	3,500 88,9	8 205	36 915
3 <sup>1</sup> / <sub>2</sub>	4,000 101,6	8 205	36 915
4	4,500 114,3	8 205	36 915
4 <sup>1</sup> / <sub>2</sub>	5,000 127,0	8 205	32 815
5	5,563 141,3	8 205	32 815
152,4 mm	6,000 152,4	10 255	30 765
6	6,625 168,3	10 255	28 715

If pipe/tubing 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 6-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:

- Refer to Table 1 on this page, and note that for 6-inch diameter steel pipe, the minimum length that should be roll grooved is 10 inches (255 mm).
- 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/Tubing Lengths" section on this page.

## LONG PIPE/TUBING LENGTHS

When roll grooving pipe/tubing 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/tubing, while allowing the pipe/tubing to rotate freely.

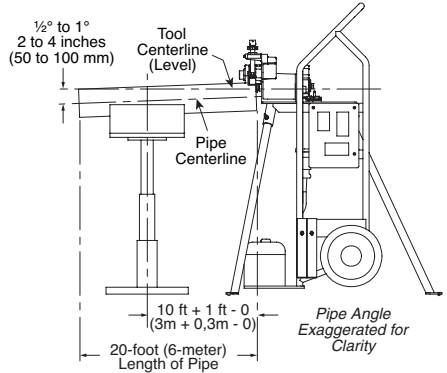
**a.** Make sure the tool is level. Refer to the "Tool Setup" section on page 6 for leveling requirements. Set the pipe stand height to produce a  $1/2^\circ - 1^\circ$  pitch on the pipe away from the tool (see Figure 1). This will help promote tracking and reduce pipe end flare.

**b.** When 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 (see Figure 2).

**c.** Installation of couplings on pipe/tubing that exceeds the maximum allowable flare may prevent pad-to-pad closure of the housings and/or may cause damage to the coupling gasket. Refer to the applicable "Roll Groove Specifications" table for details.

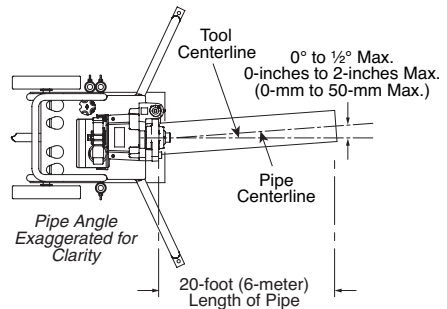
**d.** If the tool is properly set up in a level position, but the back end of the pipe/tubing is higher than the end being grooved, the pipe/tubing may not track. As a result, excessive flare may occur on the pipe/tubing end. Refer to the "Tool Setup" section, starting on page 6, and Figures 1 and 2 for tool setup and pipe/tubing positioning requirements.

**e.** Position the pipe stand at a distance slightly beyond half the pipe/tubing length from the tool. Refer to Figure 1 below.



**Figure 1 - SUPPORT OF PIPE**

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



**Figure 2 - TRACKING ANGLE**

## NOTICE

- Figure 1 shows a typical pipe stand
- Victaulic offers several pipe stands, such as the VAPS112 and VAPS224. The VAPS112 is suitable for  $3/4 - 12$ -inch sizes. The VAPS224 is suitable for  $2 - 24$ -inch sizes. Refer to the "Accessories" section on page 25.
- For additional information about the pipe stands, refer to the Operating and Maintenance Instructions Manual included with the pipe stand.

## GROOVE DIAMETER STOP ADJUSTMENT

The groove diameter stop must be adjusted for each pipe/tubing 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 31. In addition, a label is affixed to the tool, which lists the "C" dimensions.

### NOTICE

- To perform the following adjustments, use several short, scrap sections of pipe/tubing that are the proper material, diameter, and thickness to be grooved. Make sure the scrap sections meet the length requirements listed in Table 1 – Pipe/Tubing Lengths suitable for grooving on page 10.

To achieve the proper diameter:

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



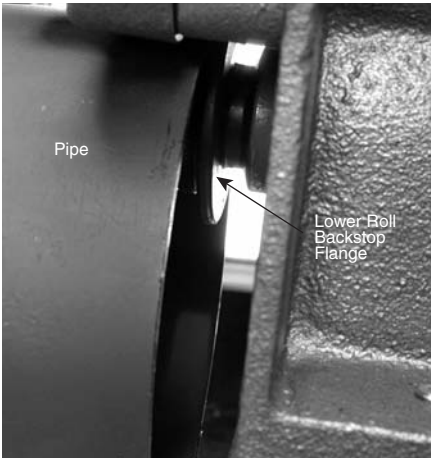
2. Using the  $\frac{3}{8}$ -inch square-drive ratchet (provided), retract (turn counter-clockwise) the feed screw/upper roll until the pipe/tubing can be slipped completely over the lower roll.



- 2a. Back off the groove-diameter stop by loosening the clamping screw with the supplied  $\frac{3}{16}$ -inch hex key allen wrench. Turn the groove-diameter stop counter-clockwise several turns.



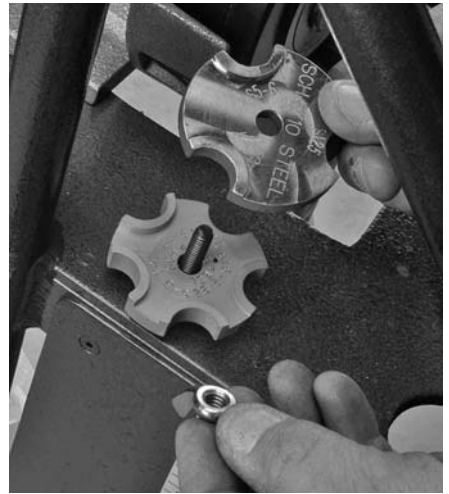
3. Insert a length of pipe/tubing that is the correct size and thickness onto the lower roll.



**4.** Make sure the pipe/tubing end contacts the lower-roll backstop flange completely.



**5.** Continue supporting the pipe manually. Using the  $\frac{3}{8}$ -inch square-drive ratchet, advance (turn clockwise) the feed screw to place the upper roll into light contact with the pipe/tubing.



**6.** Locate the groove-depth gauges on the tool. Remove the wing nut from the gauge retainer, and select the proper groove-depth gauge for the pipe size being grooved.



**7.** Using the groove-depth gauge as a “feeler gauge” between the groove-diameter stop and body nut, adjust the groove-diameter stop until it contacts the groove-depth gauge, as shown above.

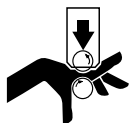
**7a.** Using the  $\frac{3}{16}$ -inch hex key allen wrench, tighten the screw on the groove-diameter stop to maintain the adjustment made in the previous step.





**8.** Replace the groove-depth gauge onto the gauge retainer. Re-install and tighten the wing nut.

**! WARNING**



**Grooving rolls can crush or cut fingers and hands.**

- Before making any tool adjustments, always disconnect the power cord from the electrical source.

- Loading and unloading pipe/tubing will place your hands close to the rollers. Keep hands away from the grooving rolls during operation.
- Never reach inside the pipe/tubing end or across the tool or pipe/tubing during operation.
- Always groove pipe/tubing in a **COUNTERCLOCKWISE** direction only.
- Never groove pipe/tubing 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.

**9.** Prepare a trial groove. Refer to the "Grooving Operation" section, starting on page 15.



**10.** After a trial groove is prepared and the pipe/tubing is removed from the tool, carefully check the groove diameter ("C" dimension). Refer to the "Roll Groove Specifications" section, starting on page 31. The 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) around the groove. The average reading must be within the required groove diameter specification.

**! CAUTION**

- The "C" dimension (groove diameter) must conform to Victaulic specifications to ensure proper joint performance.

**Failure to follow this instruction could cause joint failure, resulting in personal injury and/or property damage.**

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

**11a.** To **DECREASE** the groove diameter (increase groove depth), turn the diameter stop **counterclockwise** (when viewed from above the tool).

**11b.** To **INCREASE** the groove diameter (decrease groove depth), turn the diameter stop **clockwise** (when viewed from above the tool).



**NOTE:** A quarter-turn either way will change the groove diameter adjustment by approximately 0.013 inch (0,3 mm) or 0.051 inch (1,3 mm) per full turn.

**12** Prepare another trial groove, and check the groove diameter ("C" dimension), as described in step 10. Repeat these steps, as necessary, until the groove diameter is within specification.

## GROOVING OPERATION

### DANGER



- To reduce the risk of electric shock, check the electrical source for proper grounding.
- Before operating the tool, review the "Operator Safety Instructions" section on page 2 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/tubing designated in the "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.** Plug the safety foot switch into an internally grounded electrical source. Make sure the safety foot switch and drive motor are grounded.



3. Set the switch on the drive motor to produce **counterclockwise** rotation of the lower roll/main shaft and pipe/tubing when viewed from the front of the tool. Placing the switch in the "L" position will produce counterclockwise rotation of the lower roll/main shaft and pipe/tubing.

**! WARNING**

- The drive motor must be operated with a safety foot switch. If the drive motor does not contain a safety foot switch, contact the Victaulic Tool Company. Operating the tool without a safety foot switch could result in serious personal injury.

4. Make sure the tool is operational by depressing the safety foot-switch pedal. The lower roll/main shaft must turn **COUNTERCLOCKWISE** when viewed from the front of the tool. Remove foot from the safety foot switch.



5. Using the  $\frac{3}{16}$ -inch square-drive ratchet (provided), rotate the feed screw **counterclockwise** to move the upper roll to the full up position.

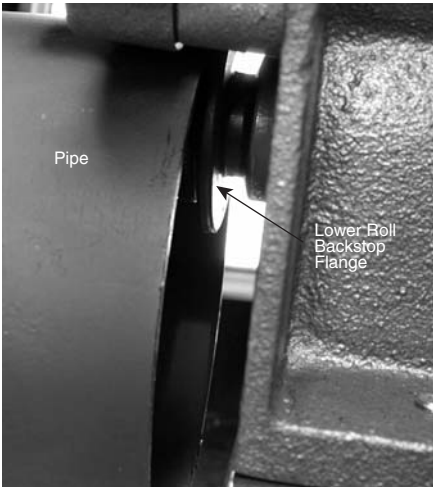
**! WARNING**

Grooving rolls can crush or cut fingers and hands.

- Before making any tool adjustments, always disconnect the power cord from the electrical source.
- Loading and unloading pipe/tubing will place your hands close to the rollers. Keep hands away from the grooving rolls during operation.
- Never reach inside the pipe/tubing end or across the tool or pipe/tubing during operation.
- Always groove pipe/tubing in a COUNTERCLOCKWISE direction only.
- Never groove pipe/tubing 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/tubing that is the correct size and thickness onto the lower roll.



**7.** Make sure the pipe/tubing end contacts the lower-roll backstop flange completely.



**8.** Rotate the feed screw **clockwise** to bring the upper roll into firm contact with the pipe/tubing. Continue to support the pipe, or use a pipe stand for long pipe/tubing lengths. Refer to the "Long Pipe/Tubing Lengths" section on page 11.

**9.** Remove hands from the pipe/tubing.



**10.** For long pipe/tubing lengths supported with a pipe stand, make sure the pipe/tubing is pitched and positioned properly. Refer to the "Long Pipe/Tubing Lengths" section on page 11.



**11.** Depress and hold down the safety foot-switch pedal. The pipe/tubing will begin to rotate counterclockwise. As the pipe/tubing rotates, begin the grooving process by rotating the feed screw **clockwise** slowly with the  $\frac{3}{8}$ -inch square-drive ratchet. Make sure the pipe/tubing remains against the lower-roll backstop flange. If the pipe/tubing does not remain against the lower-roll backstop flange, release the safety foot switch, and re-position the pipe/tubing.

## NOTICE

- Groove light-wall pipe at a moderate rate by forming grooves uniformly in 5 to 10 pipe rotations.
- Schedule 40 pipe requires more revolutions to reach the proper groove diameter.
- A shear pin is used to connect the drive socket to the feed screw. If excessive force is applied to the  $\frac{3}{8}$ -inch square-drive ratchet, the spring pin will shear and prevent damaging forces from being applied to tool components.
- The tool is designed to accommodate normal grooving forces. Therefore, shearing the pin should not occur normally. However, if a pin shears, determine the cause by referring to the "Troubleshooting" section on page 26. Correct the problem, and replace the sheared pin with a spare pin supplied with the tool.

**12.** Continue the grooving process until the groove diameter stop makes firm contact with the top of the body nut.

**13.** Continue to rotate the pipe/tubing for one to three revolutions to ensure groove completion.

**14.** Release the safety foot switch pedal, and withdraw foot from the safety foot switch.

## ⚠ WARNING

- **DO NOT** place hands inside the pipe/tubing end or in the area of the grooving rolls while the pipe/tubing is still rotating.
- Failure to follow this instruction could result in serious personal injury.

**15.** If a short length of pipe/tubing is in the tool, manually support the pipe/tubing.

**16.** To release the pipe/tubing, retract the upper roll by turning the feed screw **counterclockwise**. Remove the pipe/tubing from the tool.

## NOTICE

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

## ROLL CHANGING

### WARNING

- Before making any tool adjustments, always disconnect the power cord from the electrical source. Accidental startup of the tool could result in serious personal injury.

The VE106 Groove-N-Go roll grooving tool is designed with rolls to accommodate several pipe/tubing sizes, which eliminates the need for frequent roll changes.

In addition, different pipe/tubing materials may require different rolls. For proper roll selection, refer to the "Tool Rating and Roll Selection" section, starting on page 28.

### LOWER ROLL/MAIN SHAFT REMOVAL

When preparing to groove stainless steel pipe, copper tubing, or "ES" grooves, the lower roll/main shaft for carbon steel pipe must be removed.

In preparation for either copper tubing or "ES" grooves, the carbon steel upper roll must also now be removed (see "Upper Roll Removal" section on page 21 and "Upper Roll Installation" section on page 21). The upper roll must be installed first prior to locating the lower roll shaft in the tool body.



1. Raise the upper roll arm to its maximum position by rotating the feed screw **counter-clockwise**.

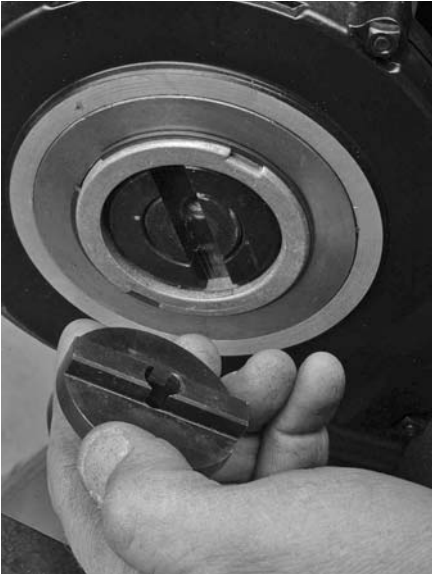


- 2 Loosen and remove the  $\frac{3}{8}$ -inch hex bolt and lock washer at the rear of the shaft.

### WARNING



- DO NOT** strike the roll with a hammer or other blunt object. Striking the roll can cause fragmentation, resulting in serious personal injury.
- Always wear safety glasses.
  - Use only the supplied punch for roll removal.
  - Never strike the roll directly for any reason.



**3.** Remove the drive key from the rear of the shaft.



**4.** Store the drive key, hex bolt, and lock washer into the safety-foot-switch storage box to prevent the items from being misplaced.



**5.** Using a punch and hammer (these tools are not furnished), tap the lower roll/main shaft out from the rear of the tool, as shown above.



**6.** Pull the lower roll/main shaft out from the front of the tool head. Using a soft cloth, remove any debris and excess grease from the lower roll/main shaft.



**7.** Store the lower roll/main shaft in a holder located on the tool cart.

**8.** Follow the "Lower Roll/Main Shaft Installation" section on page 22.



## UPPER ROLL REMOVAL

The same upper roll is used for standard grooving of carbon steel pipe and stainless steel pipe.

When preparing to groove copper tubing or "ES" grooves, the upper roll for carbon steel/stainless steel pipe must be removed and the appropriate roll must be installed.

### NOTICE

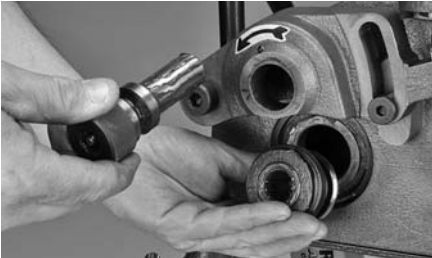
- The lower roll/main shaft must be removed prior to removing the upper roll from the upper roll shaft/arm casting.



1. Using a  $\frac{3}{32}$ -inch allen wrench (not supplied), loosen the set screw located on the top, front portion of the arm casting.



2. Prepare to support the upper roll while sliding the upper shaft out of the arm casting.



3. Remove the upper roll. Store the upper roll in the safety-foot-switch storage box.

4. Follow the "Upper Roll Installation" section shown below.

## UPPER ROLL INSTALLATION

1. Select the proper upper roll for the pipe size and material to be grooved. Refer to the "Tool Rating and Roll Selection" section on page 28.



2. Position the upper roll in the pocket of the arm casting. **NOTE:** The flange portion of the upper roll must face toward the rear of the tool, as shown above.



3. Insert the upper shaft into the arm casting and upper roll.



4. Tighten the set screw to secure the upper shaft in position. Make sure the upper roll rotates freely.
5. Lower the arm casting, and make sure the upper roll aligns properly with the lower roll/main shaft.



## LOWER ROLL/MAIN SHAFT INSTALLATION

**1.** Select the proper lower roll/main shaft for the pipe size and material to be grooved. Refer to the "Tool Rating and Roll Selection" section on page 28.

### NOTICE

- Upper roll installation must be complete prior to proceeding with lower roll/main shaft installation.



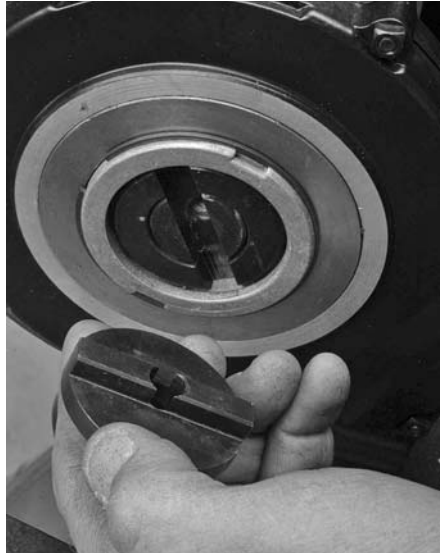
**2.** Apply graphite spray (supplied) to the lower roll/main shaft bore, as shown above.



**3.** Apply graphite spray to the main shaft, as shown above.



**4.** Install the lower roll/main shaft into the tool head. While maintaining a grip on the knurled end (lower roll) of the main shaft, make sure the flats on the drive end of the main shaft align with the flats in the drive motor.



**5.** Seat the drive key into the rear of the lower roll/main shaft.



6. Install the lock washer, and tighten the  $\frac{3}{8}$ -inch hex bolt to retain the drive key.

## MAINTENANCE

### **⚠ DANGER**

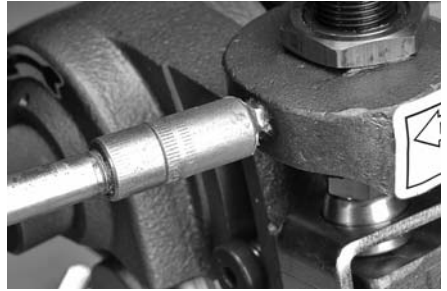


- Before performing any maintenance on the tool, disconnect the power cord from the electrical source.
- Failure to follow this instruction could result in death or serious personal injury.

This section provides information about keeping tools in proper operating condition and guidance for making repairs, when 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 2 hours of operation, apply a No. 2EP lithium-base grease to the feed screw. Apply the grease by hand to the screw threads or through the grease fitting located at the feed screw. Keep the feed screw lubricated to ensure a long service life.



**2.** Apply grease underneath the toggle pad.



**3.** Apply grease to the ball-and-socket joint of the toggle pad.



**4.** Apply grease to the locations where the roll arm slides against the tool body.



**5.** After every 8 hours of operation, apply grease to the grease fitting of the upper roll shaft.

## PARTS ORDERING INFORMATION

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When ordering parts, the following information is required for the Victaulic Tool Company to process the order and send the correct part(s). Request the RP-VE106 Repair Parts List for detailed drawings and parts listings.

1. Tool Model Number – VE106
2. Tool Serial Number – The serial number is stamped onto the tool body
3. Quantity, Part Number, and Description – For example, (1), R006106PLT, Drive Key
4. Where to Send the Part(s) – Company name and address
5. To Whose Attention to Send the Part(s)
6. Purchase Order Number

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

## ACCESSORIES

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### VAPS112 VICTAULIC ADJUSTABLE PIPE STAND



The Victaulic VAPS112 is a portable, adjustable, roller-type pipe stand that contains four legs for additional stability. Ball transfer rollers, adjustable for  $\frac{3}{4}$  - 12-inch pipe, accommodate linear and rotational movement. The turnstile design permits ease of grooving for both pipe ends. Contact Victaulic Tool Company for details.

VE106 Groove-N-Go Tool

### VAPS224 VICTAULIC ADJUSTABLE PIPE STAND



The Victaulic VAPS224 contains features that are similar to the VAPS112, but it is suitable for 2 – 24-inch pipe sizes. Contact the Victaulic Tool Company for details.

### OPTIONAL ROLLS

The following optional rolls are available for purchase. Contact the Victaulic Tool Company for details.

- Lower Roll/Main Shaft for Grooving  $1\frac{1}{4}$  - 6-inch Schedule 5S and 10S Stainless Steel Pipe (**NOTE:** The same upper roll is used for grooving carbon steel pipe and stainless steel pipe)
- Lower Roll/Main Shaft and Upper Roll for Grooving 2 – 8-inch ASTM Drawn Copper Tubing to CTS US Standard
- Lower Roll/Main Shaft and Upper Roll for 2 – 3-inch “ES” Grooves
- Lower Roll/Main Shaft and Upper Roll for 4 – 6-inch “ES” Grooves

## TROUBLESHOOTING

Problem	Possible Cause	Solution
Pipe/tubing will not stay in grooving rolls.	<p>Incorrect pipe/tubing positioning of long pipe/tubing length.</p> <p>Lower roll/main shaft and pipe/tubing are not rotating counterclockwise.</p>	<p>Refer to the "Long Pipe/Tubing Lengths" section on page 11.</p> <p>Turn the drive motor switch to the opposite rotation position.</p>
Pipe/tubing stops rotating during grooving.	<p>Rust or dirt buildup is present on the lower roll.</p> <p>Rust or dirt is excessively heavy inside the pipe/tubing end.</p> <p>Worn lower roll.</p> <p>The circuit breaker/GFI has tripped or a fuse has blown out on the electrical circuit that supplies the power drive.</p> <p>The trigger-lock switch clamp is loose.</p>	<p>Remove rust or dirt accumulation from the lower roll with a stiff wire brush.</p> <p>Remove heavy rust and dirt from inside the pipe/tubing end.</p> <p>Inspect the lower roll for worn knurls.</p> <p>Replace the lower roll/main shaft if excessive wear is present.</p> <p>Test/reset the jobsite GFI/breaker, or replace the fuse.</p> <p>Tighten the trigger-lock switch thumb screws.</p>
While grooving, loud squeaks echo through the pipe/tubing.	<p>Incorrect pipe/tubing support positioning of long pipe/tubing length. Pipe/tubing is "over-tracking."</p> <p>Pipe/tubing end is not cut square.</p> <p>Pipe/tubing is rubbing excessively on the lower-roll backstop flange.</p>	<p>Move the pipe support to the right. Refer to the "Long Pipe/Tubing Lengths" section on page 11.</p> <p>Cut the pipe/tubing end squarely.</p> <p>Remove the pipe/tubing from the tool, and apply a light coating of grease to the face of the lower-roll backstop flange, as needed.</p>
During grooving, loud thumps or bangs occur approximately once every revolution of the pipe/tubing.	<p>Pipe/tubing has a pronounced weld seam.</p>	<p>Grind the raised welds flush with the interior and exterior pipe/tubing surfaces 2 inches (50 mm) back from the pipe/tubing end.</p>
Pipe/tubing flare is excessive.	<p>Pipe/tubing support adjusted too high for long pipe/tubing length.</p> <p>Tool is tilted forward (out of level) while grooving long pipe/tubing length.</p> <p>Incorrect pipe/tubing support positioning.</p>	<p>Refer to the "Long Pipe/Tubing Lengths" section on page 11.</p> <p>Refer to the "Tool Setup" section on page 6.</p> <p>Move the pipe support to the right. Refer to the "Long Pipe/Tubing Lengths" section on page 11.</p>
The tool will not groove the pipe/tubing.	<p>Pipe/tubing is beyond the wall thickness capacity of the tool, or the pipe/tubing material is too hard.</p>	<p>Refer to the "Tool Rating and Roll Selection" section, starting on page 28.</p>

<p>Shear pin broke.</p>	<p>Rolls were being fed too fast.</p> <p>Pipe/tubing is beyond the wall thickness capacity of the tool, or the pipe/tubing material is too hard.</p> <p>The feed mechanism is binding, damaged, or insufficiently lubricated.</p>	<p>Replace the shear pin, and groove the pipe/tubing at a slower rate.</p> <p>Replace the pin, and groove pipe/tubing that is within the capacity of the tool. Refer to the "Tool Rating and Roll Selection" section, starting on page 28.</p> <p>Repair and lubricate the feed mechanism, as required.</p>
<p>Pipe/tubing grooves do not meet Victaulic specifications.</p>	<p>Groove diameter stop is not adjusted correctly.</p> <p>Pipe/tubing is beyond the wall thickness capacity of the tool, or the pipe/tubing material is too hard.</p>	<p>Refer to the "Groove Diameter Stop Adjustment" section on page 12.</p> <p>Refer to the "Tool Rating and Roll Selection" section, starting on page 28.</p>
<p>The "A" Gasket Seat or "B" Groove Width dimensions do not meet Victaulic specifications.</p>	<p>Upper roll bearing is not lubricated sufficiently.</p> <p>Incorrect upper roll, lower roll, or both installed on the tool.</p>	<p>Refer to the "Maintenance" section, starting on page 23.</p> <p>Install the correct rolls. Refer to the "Tool Rating and Roll Selection" section, starting on page 28.</p>

# TOOL RATING AND ROLL SELECTION

## STANDARD AND “ES” ROLLS FOR STEEL PIPE – COLOR-CODED BLACK

Pipe Size		Dimensions – inches/millimeters		Standard Roll Part Numbers	“ES” Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches (mm)	Steel Pipe Wall Thickness *			
		Minimum	Maximum		
1¼	1.660 42,4	0.065 1,7	0.140 3,6	Lower Roll R912106L03  Upper Roll R912106U06	Lower Roll RZ02106L03  Upper Roll RZ02106U03
1½	1.900 48,3	0.065 1,7	0.145 3,7		
2	2.375 60,0	0.065 1,7	0.154 3,9		
2½	2.875 73,0	0.083 2,1	0.203 5,2		
3	3.500 88,9	0.083 2,1	0.216 5,5	Lower Roll R904106L06  Upper Roll R912106U06	Lower Roll RZ04106L06  Upper Roll RZ04106U06
4	4.500 114,3	0.083 2,1	0.237 6,0		
4½	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		
6	6.625 168,3	0.109 2,8	0.280 7,1		

### Notes:

\* Maximum ratings on steel are limited to pipe of a Brinell Hardness Number (BHN) of 180 BHN and less. The wall thicknesses listed are nominal minimum and maximum. In addition, the following pipe sizes may be roll grooved: 76,1 mm; 108,0 mm; 127,0 mm; 133,0 mm; 139,7 mm; 152,4 mm; 159,0 mm; and 165,1 mm. Contact Victaulic Tool Company for details.

## STANDARD 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	
1¼	1.660 42,4	0.065 1,7	0.109 2,8	Lower Roll RX12106L06  Upper Roll R912106U06
1½	1.900 48,3	0.065 1,7	0.109 2,8	
2	2.375 60,0	0.065 1,7	0.109 2,8	
2½	2.875 73,0	0.083 2,1	0.120 3,0	
3	3.500 88,9	0.083 2,1	0.120 3,0	
4	4.500 114,3	0.083 2,1	0.120 3,0	
5	5.563 141,3	0.109 2,8	0.134 3,4	
6	6.625 168,3	0.109 2,8	0.134 3,4	

### Notes:

\* 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: 76,1 mm; 108,0 mm; 133,0 mm; 139,7 mm; 152,4 mm; 159,0 mm; and 165,1 mm. Contact Victaulic Tool Company for details.

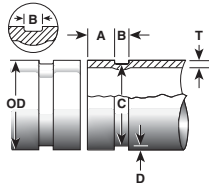


**ROLLS FOR CTS US STANDARD – ASTM DRAWN COPPER TUBING –  
COLOR-CODED COPPER**

Tube Size		Dimensions – inches/millimeters		Copper Roll Part Numbers
Nominal Size inches	Actual Outside Diameter inches (mm)	Copper Tubing Wall Thickness *		
		Minimum	Maximum	
2	2.125	0.042	0.083	Lower Roll RR02106L06  Upper Roll RR02106U06
	54,0	1,1	2,1	
2½	2.625	0.065	0.095	
	66,7	1,7	2,4	
3	3.125	0.045	0.109	
	79,4	1,1	2,8	
4	4.125	0.058	0.134	
	104,8	1,5	3,4	
5	5.125	0.072	0.160	
	130,2	1,8	4,1	
6	6.125	0.083	0.192	
	155,6	2,1	4,9	

\* ASTM B306, Type DWV and ASTM B88, Types K, L, M copper tubing  
The wall thicknesses listed are nominal minimum and maximum

# EXPLANATION OF CRITICAL ROLL GROOVE DIMENSIONS



*Exaggerated for clarity*

## Standard 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 0.030 inch (0,8 mm) for 1<sup>1</sup>/<sub>4</sub> - 3-inch sizes and 0.045 inch (1,1 mm) for 4 – 6-inch 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 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

## STEEL AND STAINLESS STEEL PIPE

Pipe Size		Dimensions – inches (millimeters)												Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
Nominal Size inches or mm	Actual OD inches (mm)	Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"		Groove Depth "D" (Ref. Only)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"	
		Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.				
1 1/4	1.660	1.676	1.644	0.625	0.656	0.594	0.281	0.312	0.250	1.535	1.520	0.063	0.049	1.77	
	42.4	42.6	41.8	15.9	16.7	15.1	7.1	7.9	6.4	39.0	38.6	1.6	1.2	45.0	
1 1/2	1.900	1.919	1.881	0.625	0.656	0.594	0.281	0.312	0.250	1.775	1.760	0.063	0.049	2.01	
	48.3	48.7	47.8	15.9	16.7	15.1	7.1	7.9	6.4	45.1	44.7	1.6	1.2	51.1	
2	2.375	2.399	2.351	0.625	0.656	0.594	0.344	0.375	0.313	2.250	2.235	0.063	0.049	2.48	
	60.3	60.9	59.7	15.9	16.7	15.1	8.7	9.5	8.0	57.2	56.8	1.6	1.2	63.0	
2 1/2	2.875	2.904	2.846	0.625	0.656	0.594	0.344	0.375	0.313	2.720	2.702	0.078	0.078	2.98	
	73.0	73.8	72.3	15.9	16.7	15.1	8.7	9.5	8.0	69.1	68.6	2.0	2.0	75.7	
76.1 mm	3.000	3.030	2.970	0.625	0.656	0.594	0.344	0.375	0.313	2.845	2.827	0.078	0.078	3.10	
	76.1	77.0	75.4	15.9	16.7	15.1	8.7	9.5	8.0	72.3	71.8	2.0	2.0	78.7	
3	3.500	3.535	3.469	0.625	0.656	0.594	0.344	0.375	0.313	3.344	3.326	0.078	0.078	3.60	
	88.9	89.8	88.1	15.9	16.7	15.1	8.7	9.5	8.0	84.9	84.5	2.0	2.0	91.4	
108.0 mm	4.250	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	
	108.0	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	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	
	114.3	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	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	
	127.0	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	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	
	133.0	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	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	
	139.7	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	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	
	141.3	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	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	
	152.4	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	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	
	159.0	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	

# ROLL GROOVE SPECIFICATIONS

## STEEL AND STAINLESS STEEL PIPE

Pipe Size		Dimensions – inches (millimeters)												Groove Depth "D" (Ref. Only)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
Nominal Size inches or mm	Actual OD inches (mm)	Pipe Outside Diameter			Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"					
		Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Max.				
165,1 mm	6.500	6.563	6.469	6.656	0.594	0.344	0.375	0.313	6.308	0.085	6.60	6.60				
	165,1	166,7	164,3	15,9	16,7	15,1	8,7	9,5	160,2	2,2	167,6	167,6				
6	6.625	6.688	6.594	6.656	0.594	0.344	0.375	0.313	6.433	0.085	6.73	6.73				
	168,3	169,9	167,5	16,7	15,1	8,7	9,5	8,0	163,4	2,2	170,9	170,9				

## STANDARD-WALL PIPE OR PLASTIC-COATED PIPE JOINED WITH STYLE HP-70ES ENDSEAL COUPLINGS

Pipe Size		Dimensions – inches (millimeters)												Groove Depth "D" (Ref. Only)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
Nominal Size inches or mm	Actual OD inches (mm)	Pipe Outside Diameter			Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"					
		Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Max.				
2	2.375	2.399	2.351	0.572	0.552	0.265	0.250	2.250	0.063	2.480	0.154	2.480				
	60,3	60,9	59,7	14,5	14,0	6,7	6,4	57,2	1,6	63,0	3,9	63,0				
2 1/2	2.875	2.904	2.846	0.572	0.552	0.265	0.250	2.720	0.078	2.980	0.203	2.980				
	73,0	73,8	72,3	14,5	14,0	6,7	6,4	69,1	2,0	75,7	5,2	75,7				
3	3.500	3.535	3.469	0.572	0.552	0.265	0.250	3.344	0.083	3.600	0.216	3.600				
	88,9	89,8	88,1	14,5	14,0	6,7	6,4	84,9	2,1	91,4	5,5	91,4				
4	4.500	4.545	4.469	0.610	0.590	0.320	0.300	4.334	0.083	4.600	0.237	4.600				
	114,3	115,4	113,5	15,5	15,0	8,1	7,6	110,1	2,1	116,8	6,0	116,8				
6	6.625	6.688	6.594	0.610	0.590	0.320	0.300	6.455	0.085	6.730	0.280	6.730				
	168,3	169,9	167,5	15,5	15,0	8,1	7,6	164,0	2,2	170,9	7,1	170,9				

# ROLL GROOVE SPECIFICATIONS

## COPPER TUBING TO CTS US STANDARD – ASTM B-88 AND ASTM B-306

Copper Tubing Size	Dimensions – inches/millimeters														Groove Depth "D" (Ref. Only)	Min. Allow. Wall Thick. "T"	Max. Allow. Flare Dia. "F"
	Copper Tubing Outside Diameter ‡				Gasket Seat "A"				Groove Width "B"				Groove Diameter "C"				
	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Min.					
2	2.127	2.123	0.610	0.640	0.580	0.330	0.300	2.029	2.009	0.048	DWV*	2.220					
54.0	54.0	53.9	15.5	16.3	14.7	8.4	7.6	51.5	51.0	1.2		56.4					
2 1/2	2.627	2.623	0.610	0.640	0.580	0.330	0.300	2.525	2.505	0.050	0.065	2.720					
66.7	66.7	66.6	15.5	16.3	14.7	8.4	7.6	64.1	63.6	1.2	1.7	69.1					
3	3.127	3.123	0.610	0.640	0.580	0.330	0.300	3.025	3.005	0.050	DWV*	3.220					
79.4	79.4	79.3	15.5	16.3	14.7	8.4	7.6	76.8	76.3	1.2		81.8					
4	4.127	4.123	0.610	0.640	0.580	0.330	0.300	4.019	3.999	0.053	DWV*	4.220					
104.8	104.8	104.7	15.5	16.3	14.7	8.4	7.6	102.1	101.6	1.4		107.2					
5	5.127	5.123	0.610	0.640	0.580	0.330	0.300	4.999	4.979	0.063	DWV*	5.220					
130.2	130.2	130.1	15.5	16.3	14.7	8.4	7.6	127.0	126.5	1.6		132.6					
6	6.127	6.123	0.610	0.640	0.580	0.330	0.300	5.999	5.979	0.063	DWV*	6.220					
155.6	155.6	155.5	15.5	16.3	14.7	8.4	7.6	152.3	151.9	1.6		158.0					
8	8.127	8.121	0.610	0.640	0.580	0.330	0.300	7.959	7.939	0.083	DWV*	8.220					
206.4	206.4	206.3	15.5	16.3	14.7	8.4	7.6	202.2	201.7	2.1		208.8					

‡ The outside diameter of roll grooved copper tubing cannot vary from the tolerance listed. The maximum allowable tolerance from square cut ends is 0.030 inch (0,8 mm) for 2 – 3-inch (54,0 – 79,4-mm) sizes and 0.045 inch (1,1 mm) for 4 – 6-inch (104,8 – 155,6-mm) sizes; this is measured from the true square line.

\* ASTM B-306 drain-waste and vent (DWV) is the minimum wall thickness of copper tubing that can be roll grooved.

## VICTAULIC GLOBAL LOCATIONS

### VICTAULIC TOOL COMPANY

P.O. Box 31  
Easton, PA 18044-0031  
1-610-559-3300  
1-610-923-3090 (fax)  
victtools@victaulic.com

### TOOL SHIPMENTS

1326 Tatamy Road  
Easton, PA 18045-7400

### SALES AND LEASE PAYMENTS

P.O. Box 8538-244  
Philadelphia, PA 19171-0244

### WORLD HEADQUARTERS

P. O. Box 31  
Easton, PA USA 18044-0031

4901 Kesslersville Road  
Easton, PA 18040 USA

1-800-PICK-VIC  
(1-800-742-5842)  
1-610-559-3300  
1-610-250-8817 (fax)  
pickvic@victaulic.com

### VICTAULIC CONSTRUCTION PIPING SERVICES DIVISION

1818 Vultee Street  
Allentown, PA 18103  
1-610-559-3488  
1-610-923-3170 (fax)  
cps@victaulic.com

### UNITED STATES

P.O. Box 31  
Easton, PA 18044-0031  
1-610-559-3300  
1-610-250-8817 (fax)  
victaulic@victaulic.com

### CANADA

123 Newkirk Road  
Richmond Hill, ON L4C 3G5  
905-884-7444  
905-884-9774 (fax)  
viccanada@victaulic.com

### EUROPE

Prijkelstraat 36  
9810 Nazareth, Belgium  
32-9-381-15-00  
32-9-380-44-38 (fax)  
viceuro@victaulic.be

### CENTRAL AND SOUTH AMERICA

P.O. Box 31  
Easton, PA USA 18044-0031

4901 Kesslersville Road  
Easton, PA 18040 USA

1-610-559-3300  
1-610-559-3608 (fax)  
vical@victaulic.com

### AUSTRALASIA

Room 707  
No. 600 Min Sheng Road  
Pudong, Shanghai  
200135, China  
86-21-58855151  
86-21-58851298 (fax)  
vicap@victaulic.com