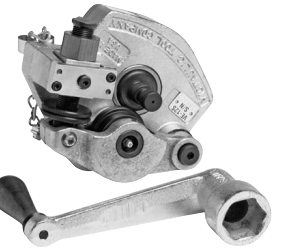
VE12 Manual Roll Grooving Tool



WARNING

⚠ WARNING

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

- **Before operating or servicing any roll grooving tools, read all instructions in this manual and all warning labels on the tool.**
- **Wear safety glasses, hardhat, foot protection, and hearing protection while working around this tool.**
- **Save this operating and maintenance manual in a place accessible to all operators of the tool.**

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

Original Instructions

TABLE OF CONTENTS

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 VE12 tool is designed only for manually roll grooving ¾–2 inch Schedule 5 and 10 steel, as well as 1–2 inch Schedule 40 steel, stainless steel, aluminum, and PVC pipe. These instructions must be read and understood by each operator PRIOR to working with the grooving tools. These instructions describe safe operation of the tool, including set up and maintenance. Each operator must become familiar with the tool's operations, applications, and limitations. Particular care should be given to reading and understanding the dangers, warnings, and cautions described throughout these operating instructions.

Use of these tools requires dexterity and mechanical skills, as well as sound safety habits. Although these tools are designed and manufactured for safe, dependable operation, it is difficult 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 set up and maintenance. It is the responsibility of the lessee or user of these tools to ensure that all operators read this manual and fully understand the operation of these tools.

Store this manual in a clean, dry area where it is always readily available. Additional copies of this manual are available upon request through Victaulic.

⚠ WARNING

1. **Wear proper apparel.** Do not wear loose clothing, jewelry, or anything that can become entangled in moving parts.
2. **Wear protective items when working with tools.** Always wear safety glasses, hardhat, foot protection, gloves, and hearing protection.
3. **Keep hands and tools away from grooving bits and tracking wheel during the grooving operation.** Grooving area can crush or cut fingers and hands.
4. **Do not reach inside the pipe ends during tool operation.** Pipe edges can be sharp and can snag gloves, hands, and shirt sleeves.

⚠ CAUTION

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.**
2. **Inspect the equipment.** Before using the tool, check all moveable parts for any obstructions. Ensure that guards and tool components are installed and adjusted properly.
3. **Stay alert.** Do not operate the tool if you are drowsy from medication or fatigue.
4. **Keep visitors away from the immediate work area.** All visitors should be kept a safe distance from the equipment at all times.
5. **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 spills.
6. **Secure the work, tool, and accessories.** Ensure that the tool is stable. Refer to the "Tool Setup" section.
7. **Support the work.** Pipe should be supported by a pipe stand that is secured to the floor or to the ground.
8. **Do not force the tool.** Do not force the tool or accessories to perform any functions beyond the capabilities described in these instructions. Do not overload the tool.
9. **Maintain tool with care.** Keep the tool clean at all times to ensure proper and safe performance. Follow the instructions for lubricating tool components.
10. **Use only Victaulic replacement parts and accessories.** Use of any other parts may result in a voided warranty, improper operation, and hazardous situations.
11. **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.**

The Victaulic VE12 is a manually operated tool used for roll grooving pipe to prepare it to receive Victaulic grooved couplings. This tool may not be driven by any power drive device. The use of power drive devices may present risk to the operator and cause damage to the tool.

⚠ WARNING

- **Use of a power drive with this tool may cause the tool to walk off the pipe or to rotate at speeds that may be uncontrollable by the operator.**

Failure to follow this instruction could result in personal injury or property damage.

⚠ CAUTION

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

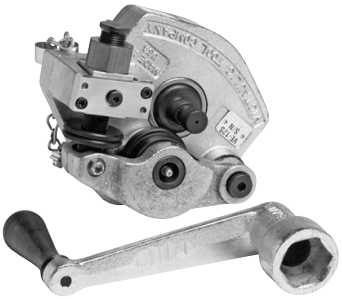
Failure to follow this instruction could overload the tool, resulting in reduced tool life and/or damage to the tool.

RECEIVING THE TOOL

VE12 tools are packed individually in heavy cardboard containers. Save the original container for return shipment of rental tools.

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

CONTAINER CONTENTS



Qty.	Description
1	VE12 Tool
1	Set of Groove Depth Gauges (attached to tool)
1	Hand Crank
2	VE12 Operating and Maintenance Instructions Manual

POWER REQUIREMENTS

Not applicable to this tool.

TOOL NOMENCLATURE

NOTICE

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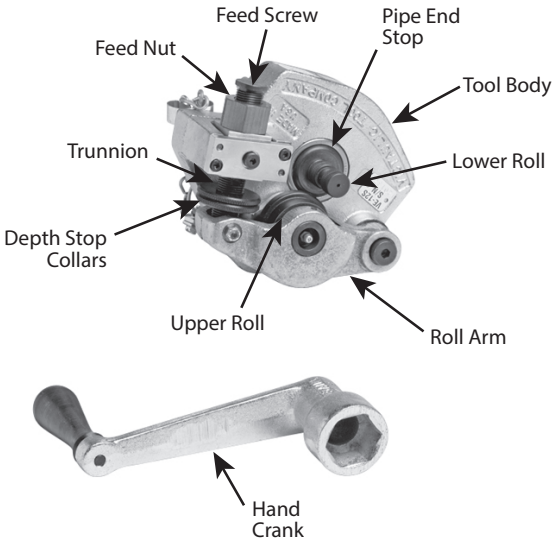
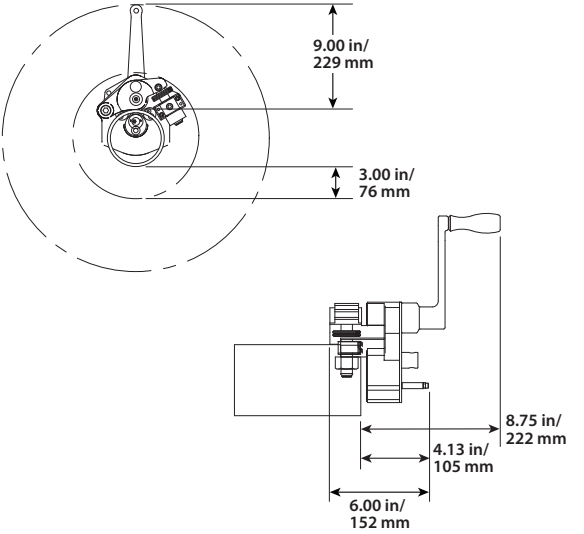


TOOL DIMENSIONS AND SPECIFICATIONS



Tool weight is 17 pounds/8 kilograms.

Tool sound pressure is below 70 dB(A).

TOOL AND PIPE SETUP

VE12 tools can be used to groove pipe that is supported by several different methods. Refer to the setup instructions listed in this section for different grooving options.

PIPE VISE SETUP

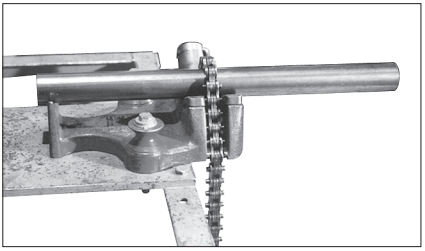
1. When grooving pipe that is supported with a pipe vise, select a location for the tool and pipe vise by taking into consideration the following factors:

a. Adequate space to handle pipe/tubing lengths

b. A firm and level surface for the pipe vise

c. Anchoring requirements for the pipe vise

2. Mount a chain-type pipe vise onto a stand or workbench. The pipe vise should be mounted flush with, or slightly overhanging, the edge of the stand or workbench. When the tool is mounted on the pipe, the tool must be able to rotate freely around the pipe without being obstructed by the stand or workbench.



3. Secure a length of pipe/tubing in the pipe vise. Pipe/tubing position and pipe vise anchoring must be capable of handling the weight of the tool (17 pounds/8 kilograms), plus the manual effort required to operate the tool (approximately 20 ft-lbs/27 N•m of torque). Position the pipe/tubing to overhang the pipe vise by approximately 5–12 inches/125–300 mm, as shown, so that the tool can rotate freely.

GROOVE-IN-PLACE SETUP

⚠ WARNING

- **Depressurize and drain the piping system before attempting to disassemble any Victaulic piping products.**
- **Pipe hangers must be capable of handling the weight of the tool and the manual effort required to operate the tool.**

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

Previously installed pipe/tubing may be grooved with a VE12 tool, provided that the pipe/tubing is supported securely and that the system is completely depressurized and drained. Pipe hangers must be capable of handling the weight of the tool (approximately 17 pounds/8 kilograms), plus the manual effort required to operate the tool (approximately 20 ft-lbs/27 N•m).

Ensure that there is adequate clearance around the pipe/tubing to permit proper tool rotation during the grooving process. Refer to the Tool Dimensions and Specifications section.

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/tubing MUST be used with Victaulic FlushSeal® gaskets. Beveled-end pipe may be used for other applications, provided that the wall thickness is standard wall (ANSI B36.10) or less and that the bevel meets ANSI B16.25 (37½º) or ASTM A-53 (30°). **NOTE:** Roll grooving beveled-end pipe may result in unacceptable flare.

2. 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.

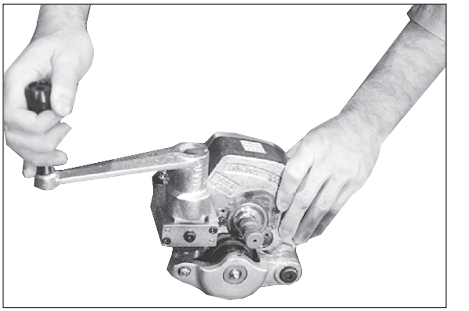
3. All coarse scale, dirt, and other foreign material must be removed from the interior and exterior surfaces of the pipe ends.

⚠ CAUTION

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.

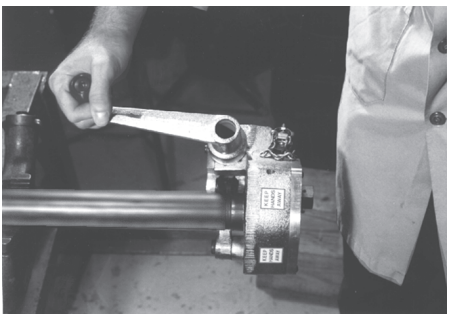
Foreign material may interfere with or damage grooving rolls, resulting in distorted grooves and grooves that are out of Victaulic specifications.

MOUNTING THE TOOL



1. Using the crank, retract the upper roll arm fully by turning the feed nut counterclockwise.

2. With the drive nut down, insert the lower roll into the pipe end. Push the tool onto the pipe until the pipe end stop rests against the pipe end.



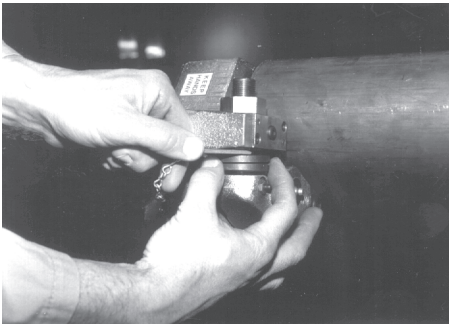
3. Using the crank, advance rolls together by turning the feed nut clockwise. Continue advancing until the grooving rolls are in light, but firm, contact with the pipe.

ADJUSTING THE GROOVE DEPTH

The depth stop collars must be adjusted for each pipe size or change in wall thickness. Groove diameter, identified as the "C" dimension for each pipe size, is listed under the "Roll Groove Specifications" section. A "C" Diameter Chart for the most common pipe sizes is also on the tool.

1. Unlock the depth stop collars by turning them in opposite directions until they are separated.

2. Locate the groove depth gauge attached to the tool that matches the pipe size to be grooved.



3. Turn the depth stop collar, closest to the trunnion, until the distance between the collar and the top of the trunnion is equal to the groove depth gauge thickness. Use the groove depth gauge like a feeler gauge. Turn the second collar until both are locked firmly against one another, maintaining the gap set with the groove depth gauge.

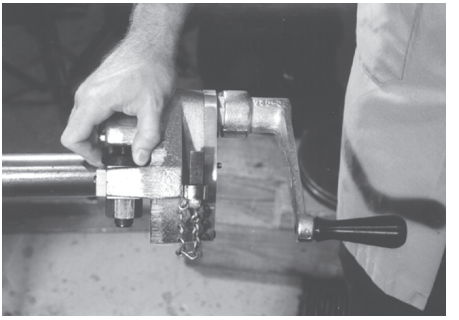
4. Prepare a trial groove as described in the "Grooving Operation" section.

5. After a trial groove is prepared and the tool is removed from the pipe, carefully check the groove diameter ("C" dimension), as charted in the "Roll Groove Specifications" section. The "C" dimension is best checked with a pi-tape. It also may be checked with a vernier caliper or narrow land micrometer at two locations, 90° apart, around the groove. The average reading must equal 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.



6. If the groove diameter ("C" dimension) is not within tolerance, the depth stop collar must be adjusted to obtain the proper dimension. To adjust for a smaller groove diameter, turn the depth stop collars **counterclockwise**. To adjust for a larger groove diameter, turn the depth stop collars **clockwise**. A quarter turn either way will change the groove diameter by 0.017 inch. A full turn either way will change the groove diameter by 0.068 inch.

7. Prepare another trial groove and check the groove diameter again. Repeat steps 4 and 5 until the groove diameter is within specification.

VE12 FEED RATES

Pipe Material	Wall Thickness inches/mm	Recommended Turns of Feed Nut to Advance the Grooving Roll
Steel and Stainless Steel	0.065 to 0.109 1.65 to 2.76	½ turn
	0.110 to 0.154 2.77 to 3.91	¼ turn
Aluminum	0.065 to 0.109 1.65 to 2.76	⅔ turn
	0.110 to 0.154 2.77 to 3.91	⅓ turn
PVC	0.113 to 0.154 2.87 to 3.91	¾ turn

GROOVING OPERATION

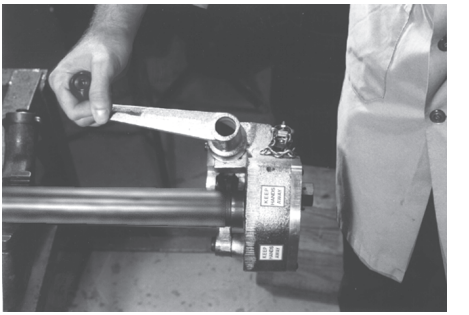
⚠ CAUTION

- **This tool must be used ONLY for roll grooving pipe designated in the "Tool Ratings" 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. Ensure that the proper tool is selected for the pipe to be grooved. Refer to the "Tool Rating" section for details.

2. Before grooving, ensure that all applicable instructions in the previous sections of this manual have been followed.

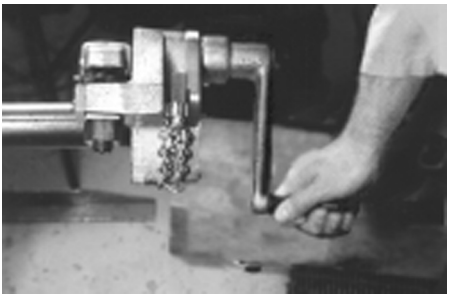


3. Advance the feed by turning the feed nut clockwise by the amount shown in the "Feed Rates" section. Feed rates for the VE12 vary depending on material and wall thickness.

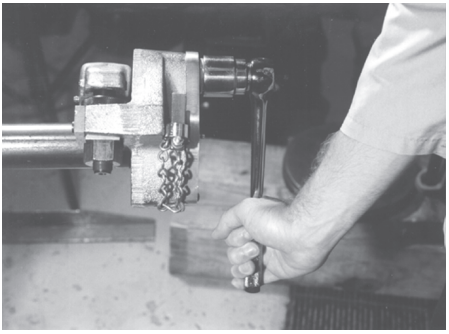
⚠ CAUTION

- **DO NOT exceed the feed rates listed in this section.**
- **Over-tightening (over-feeding) will result in shortened bearing life and other tool damage.**

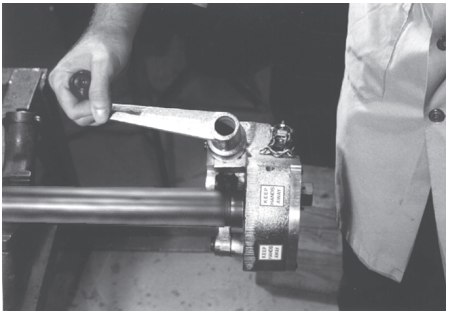
Failure to follow these instructions could cause personal injury and/or tool damage.



4. Place the crank onto the drive hex. Crank the drive hex either clockwise or counterclockwise until the tool travels one full turn around the pipe.



5. A ratchet with 1¼" socket (not supplied) may be used in place of the crank to operate the tool in low clearance conditions.

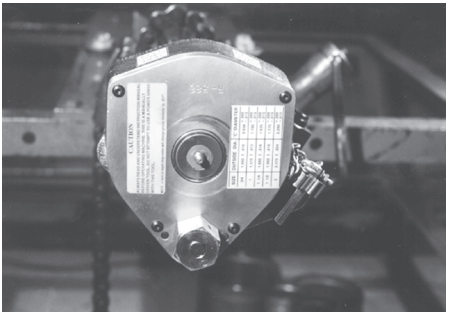


6. Advance the feed by cranking the feed nut per the "Feed Rates" section. Crank the tool another full turn around the pipe.

Continue grooving by advancing the feed, cranking the groover around the pipe until the depth stop collar comes in contact with the trunnion. At this point, the feed nut can no longer be advanced.

Crank the tool at least one more full turn around the pipe after full groove depth is achieved to ensure a consistent groove.

DISMOUNTING THE TOOL

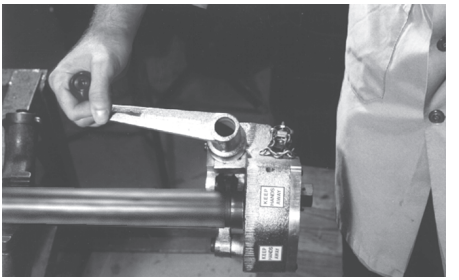


1. Crank the tool until the drive hex is located in the down position.

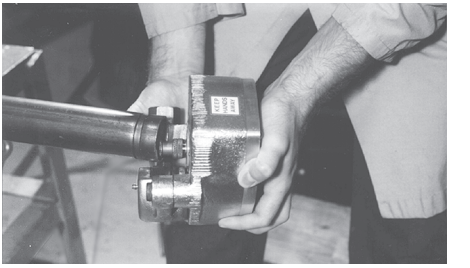
⚠ CAUTION

- **Always support the tool while retracting the feed nut. Retracting the feed nut loosens the tool from the pipe.**

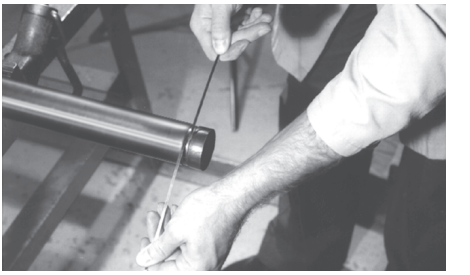
Failure to follow these instructions could cause the tool to fall, resulting in personal injury and/or tool damage



2. Turn the feed nut counterclockwise to retract the upper roll arm to the full open position.



3. Lift the tool and remove it from the pipe.



4. After dismounting the tool from the pipe, check the groove diameter to ensure that the groove meets specification.

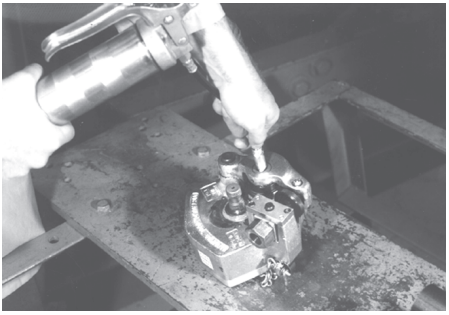
NOTICE

Groove Diameter should be correct for the diameter and wall thickness of pipe for which it was set under the "Adjusting The Groove Depth" section. Groove diameter should be checked periodically and adjusted as necessary.

MAINTENANCE

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 to ensure proper and safe operation of the tool.



LUBRICATION

1. After approximately eight hours of operation, grease the bearings at the two grease fittings on the tool. Use a No. 2EP lithium-based grease.

2. On a weekly basis, apply a light oil (SAE 10W-30 or equivalent) to the threads where the feed screw passes through the feed nut. Oil should be applied to the shoulder bolts that hold the roll arm to the body, the feed screw to the roll arm, and at trunnion pivots.

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 RP-VE12 Repair Parts List for detailed drawings and parts listings.

1. Tool Model Number – VE12
2. Tool Serial Number – The serial number is stamped onto the tool body
3. Quantity, Part Number, and Description
4. Where to Send the Part(s) – Company Name and Address
5. To Whose Attention to Send the Part(s)
6. Purchase Order Number

Parts can be ordered by calling 1-800-PICK VIC.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Unable to close rolls on pipe.	Improper adjustment of the depth stop collar.	Turn the depth stop collar counterclockwise, away from the trunnion, and reset the depth stop collar. Refer to "Adjusting The Groove Depth".
The groove is too deep (groove diameter is too shallow).	Improper adjustment of depth stop collar.	Reset the depth stop collar as described in "Adjusting The Groove Depth".
The groove is too shallow (groove diameter is too deep).	Improper adjustment of depth stop collar.	Reset the depth stop collar as described in "Adjusting The Groove Depth".
The tool does not move when cranked.	Rust or dirt has built up on the lower roll.	Remove accumulation from the lower roll with a stiff wire brush.
	Worn grooving rolls.	Inspect the lower roll for worn knurls and replace if worn.
The tool wobbles during cranking.	Variation in pipe wall thickness or inadequate feed rate.	Advance the feed to the rate described in the "Feed Rate" chart.

In the event of tool malfunction outside the scope of the troubleshooting section, contact Victaulic Engineering Services for assistance.

TOOL RATING

Nominal Pipe Size inches/mm	Steel/Aluminum inches/mm		PVC inches/mm		Stainless Steel inches/mm	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
¾ 20	0.065 1.65	0.083 2.10	– –	– –	– –	– –
1 25	0.065 1.65	0.133 3.38	0.133 3.38	0.133 3.38	0.133 3.38	0.133 3.38
1¼ 32	0.065 1.65	0.140 3.56	0.140 3.56	0.140 3.56	0.140 3.56	0.140 3.56
1½ 40	0.065 1.65	0.145 3.68	0.145 3.68	0.145 3.68	0.145 3.68	0.145 3.68
2 50	0.065 1.65	0.154 3.91	0.154 3.91	0.154 3.91	0.154 3.91	0.154 3.91

Pipe Dimension Rating Chart is based on the following material grades:
Steel – Brinell Hardness of 180 or less
Stainless Steel – Type 304 and 316
Aluminum – ASTM B-210 in Grades 6061-T4 and 6063-T4
PVC:
Type I, Grade I – PVC 1120
Type I, Grade II – PVC 1220
Type II, Grade I – PVC 2116

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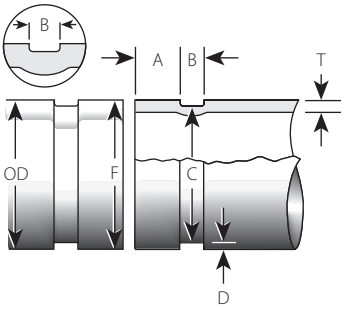
EXPLANATION OF CRITICAL ROLL GROOVE DIMENSIONS FOR ORIGINAL GROOVE SYSTEM (OGS) PRODUCTS

⚠ WARNING

- **Pipe dimensions and groove dimensions must be within the tolerances specified in the tables on the following pages to ensure proper joint performance.**

Failure to follow these specifications could cause joint failure, resulting in serious personal injury and/or property damage.



STANDARD ROLL GROOVE

Illustration is exaggerated for clarity

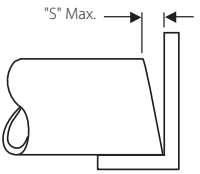
NOTICE

FOR STANDARD COUPLINGS WITH RATINGS ON LIGHT-WALL STAINLESS STEEL PIPE:

- **Victaulic RX rolls MUST be used when roll grooving light-wall stainless steel pipe for use with standard couplings.**

Pipe Outside Diameter – Nominal NPS Pipe Size (ANSI B36.10) and Basic Metric Pipe Size (ISO 4200) – The average pipe outside diameter must not vary from the specifications listed in the tables on the following pages. Maximum allowable pipe ovality shall comply with the requirements of ASTM A-999 and API 5L. Greater variations between the major and minor diameters will result in difficult coupling assembly.

For NPS pipe, the maximum allowable tolerance from square-cut pipe ends is: 1/16 inch/1.6 mm for 4 to 24-inch/114.3 to 610-mm sizes and 3/32 inch/2.4 mm for 26-inch/660-mm and larger sizes. This is measured from the true square line.



Any internal and external weld beads or seams must be ground flush to the pipe surface. The inside diameter of the pipe end must be cleaned to remove coarse scale, dirt, and other foreign material that might interfere with or damage grooving rolls. The front edge of the pipe end shall be uniform with no concave/convex surface features that will cause improper grooving roll tracking or result in difficulties during coupling assembly.

"A" Dimension – The "A" dimension, or the distance from the pipe end to the groove, identifies the gasket seating area. This area must be free from indentations, projections (including weld seams), and roll marks from the pipe end to the groove to ensure a leak-tight seal. All foreign material, such as loose paint, scale, oil, grease, chips, rust, and dirt must be removed.

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

"C" Dimension – The "C" dimension is the average 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. The groove diameter must conform to the "C" dimension described above.

"F" Dimension – Maximum allowable pipe-end flare diameter is measured at the extreme pipe-end diameter. **NOTE:** This applies to average (pi tape) and single-point readings.

"T" Dimension – The "T" dimension is the lightest grade (minimum nominal wall thickness) of pipe that is suitable for cut or roll grooving. Pipe that is less than the minimum nominal wall thickness for cut grooving may be suitable for roll grooving or adapted for Victaulic couplings by using Vic-Ring® Adapters. Vic-Ring Adapters can be used in the following situations (contact Victaulic for details):

- When pipe is less than the minimum nominal wall thickness suitable for roll grooving
- When pipe outside diameter is too large to roll or cut groove
- When pipe is used in abrasive services

NOTICE

- **Coatings that are applied to the interior surfaces of Victaulic grooved and plain-end pipe couplings must not exceed 0.010 inch/0.25 mm. This includes the bolt pad mating surfaces.**
- **In addition, the coating thickness applied to the gasket-sealing surface and within the groove on the pipe exterior must not exceed 0.010 inch/0.25 mm.**

ROLL GROOVE SPECIFICATIONS

STEEL AND OTHER IPS PIPE

Size		Dimensions – inches/millimeters												
		Pipe Outside Diameter		Gasket Seat "A"			Groove Width "B"			Groove Diameter "C"				
Nominal Size inches/mm	Actual Outside Diameter inches/mm	Max.	Min.	Basic	Max.	Min.	Basic	Max.	Min.	Max.	Min.	Groove Depth "D" (ref.)	Min. Allow. Wall Thick. "T" †	Max. Allow. Flare Dia. "F"
¾ 20	1.050 26.9	1.060 26.9	1.040 26.4	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	0.938 23.8	0.923 23.4	0.056 1.4	0.049 1.2	1.15 29.2
1 25	1.315 33.7	1.328 33.7	1.302 33.1	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.190 30.2	1.175 29.9	0.063 1.6	0.049 1.2	1.43 36.3
1 ¼ 32	1.660 42.4	1.676 42.6	1.644 41.8	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.535 39.0	1.520 38.6	0.063 1.6	0.049 1.2	1.77 45.0
1 ½ 40	1.900 48.3	1.919 48.7	1.881 47.8	0.625 15.9	0.656 16.7	0.594 15.1	0.281 7.1	0.312 7.9	0.250 6.4	1.775 45.1	1.760 44.7	0.063 1.6	0.049 1.2	2.01 51.1
2 50	2.375 60.3	2.399 60.9	2.351 59.7	0.625 15.9	0.656 16.7	0.594 15.1	0.344 8.7	0.375 9.5	0.313 8.0	2.250 57.2	2.235 56.8	0.063 1.6	0.049 1.2	2.48 63.0

† Except PVC. See "Tool Rating" chart on page 18.

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