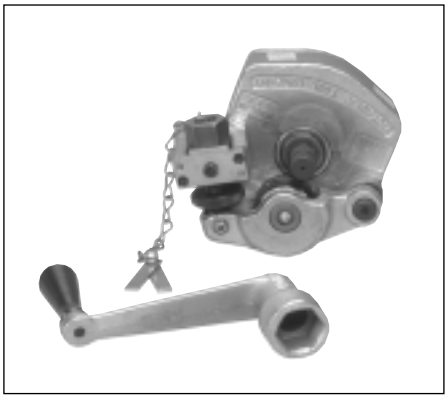
Operating and Maintenance Instructions Manual

VE12

Manual Grooving Tools



⚠ WARNING

Failure to follow Instructions and warnings can result in serious injury.

- **Before installing, operating, or servicing the VE12 Tool, read this Manual and all warning labels on the tools.**
- **Always wear safety glasses and foot protection.**

If you need additional copies of the manual or have any questions about the safe operation of these tools, contact Victaulic Tool Company, P.O. Box 31, Easton, PA 18044-0031, 610-559-3300.

VE12

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Read this first

Definitions for identifying the various hazard levels shown on warning labels or to indicate proper safety procedures in this Manual are provided below.

This safety alert symbol indicates important safety messages on warning labels and in this manual. When you see this symbol be alert to the possibility of personal injury and carefully read and fully understand the message that follows.

⚠ WARNING

The use of the word "WARNING" signifies the presence of hazards or unsafe practices which could result in severe personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

The use of the word "CAUTION" signifies possible hazards or unsafe practices which could result in minor injury, product or property damage if instructions, including precautions, are not followed.

NOTICE

The use of the word "NOTICE" signifies special instructions which are important but not related to hazards.

OPERATOR SAFETY INSTRUCTIONS

This tool is designed only for manually roll grooving ¾ - 2" Schedule 5 and 10 steel as well as 1 - 2" Schedule 40 steel, stainless steel, aluminum and PVC pipe.

Accomplishing this function requires some dexterity and mechanical skills, as well as sound safety habits. Although these tools are manufactured for dependable operation, it is impossible to anticipate those combinations of circumstances which could result in an accident. The following instructions are recommended for proper tool operation. The operator is cautioned to always practice "Safety First" during each phase of use, including setup and maintenance of this unit.

General

1. **Read and understand this operating manual before operating or performing maintenance on this tool.** Become familiar with the tool's operations, applications and limitations. Be particularly aware of its specific hazards. Store the operatorm's manual in a clean area and always at a readily available location. Additional copies at no charge can be obtained through written requests to the Victaulic Tool Company.
2. **This tool is designed ONLY for the roll grooving of IPS pipe sizes listed under "Tool Rating Chart"** (page 10).

Tool Set-Up

1. **Avoid dangerous environments.** Keep work area well lit. Allow sufficient space to operate tool and accessories properly and for others to pass safely.

Operating Tool

1. **Inspect the equipment.** Prior to using the tool, check the movable parts for any obstructions. Be certain that all tool parts are properly installed and secured.
2. **Secure pipe before working.** Make certain the pipe is secured or otherwise capable of resisting the manual effort to operate the tool (torque) plus the weight of the tool.
3. Never reach inside pipe ends during operation.
4. **Do not overreach.** Keep your proper footing and balance at all times. Do not reach across the tool or pipe. Keep hands and loose tools away from moving elements.
5. Use safety glasses and proper footwear.
6. **Keep work area clean.** Cluttered areas, benches and slippery surfaces invite accidents.
7. **Wear ear protection if exposed to long periods of very noisy shop operations.**
8. **Keep visitors away.** All visitors should be kept a safe distance from the work area.
9. **Keep alert.** Do not operate tool if ill or drowsy from medication or fatigue. Avoid horseplay around equipment and keep bystanders a safe distance from equipment.
10. Do not operate tool at feed rates exceeding those specified in this manual.
11. **Wear proper apparel.** Loose clothing (unbuttoned jackets or loose sleeve cuffs) and jewelry can get caught in moving parts. Wear a hardhat when performing overhead grooving with this tool.
12. **Do not force tool.** It will do the job better and safer at the rate for which it was designed.
13. **Do not misuse tool.** Perform only the functions for which the tool is designed. Do not overload the tool.

Tool Maintenance

1. **Do not attempt to repair the tool on your own.** Repairs should be made only by authorized personnel.
2. **Maintain tool in top condition.** Keep tool clean for best and safest performance. Follow lubricating instructions.

VE12

INTRODUCTION

The VE12 is an orbital roll grooving tool which rotates around a stationary pipe. The pipe may be held in a pipe vise during grooving. The VE12 also is able to groove piping in a depressurized and drained, in-place piping system.

The Victaulic VE12 tool is a manually operated tool used for roll grooving pipe to prepare it to receive Victaulic grooved couplings. This tool is not to 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.

⚠ CAUTION

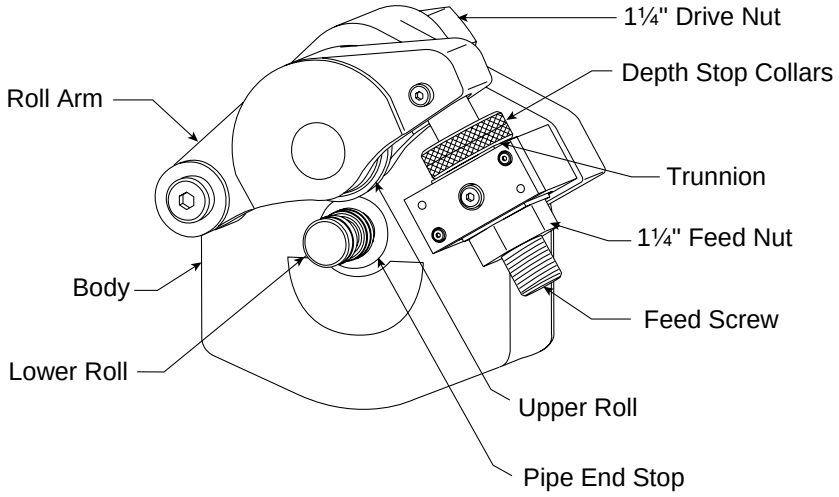
Use of a power drive with this tool may cause the tool to walk off the pipe or rotate at speeds that may be uncontrollable by the operator, causing personal injury or property damage.

These tools are designed to properly roll groove pipe of various types within the size range and wall thickness shown in the dimension charts on the following pages. These tools should be used only for roll grooving pipe (designated in the charts) clamped in a pipe vise or in place. Use of these tools for purposes other than roll grooving, or exceeding the maximum pipe wall thickness, will overload the tools, shorten tool life and possibly cause damage.

⚠ CAUTION

This tool should be used only for roll grooving pipe designated in the Tool Rating Chart. Use of this tool for other purposes or exceeding the pipe thickness maximums will overload the tool, shorten tool life and may cause tool damage.

TOOL NOMENCLATURE



RECEIVING TOOL

The VE12 tool is individually packaged in a heavy cardboard container. Upon receipt, check to be certain all necessary parts are included.

Included should be:
(1) Victaulic VE12 tool
(1) Set of feeler gauges (attached to tool)
(1) Crank
(2) Operating Instruction Manual

If incomplete, contact your Victaulic Distributor or the Victaulic Tool Company.

PRE-OPERATION

Pipe Preparation
For proper tool operation, and production of proper pipe grooves, carefully observe the following pipe preparation tips.

1. Pipe ends must be square cut (see column 2 notation on "Standard Roll Groove Specifications - Steel and other IPS Pipe", page 9).

2. Internal or external weld bead or seams must be ground flush with the pipe surface extending 2" back from the pipe end.

3. The end of the pipe, both inside and out, must be cleaned of coarse scale, dirt and other foreign material.

⚠ CAUTION

Foreign material such as coarse scale or dirt might interfere with or damage the grooving rolls or distort the groove. Rust is an abrasive material and will tend to wear out the surface of the grooving rolls. For maximum grooving roll life, remove foreign material and loose rust.

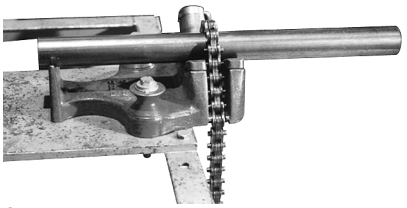
TOOL AND PIPE SET UP

This tool can be used to groove pipe clamped in a pipe vise or pipe that is in place.

Pipe Vise Set Up
The choice of grooving location in the shop or field should take into account the following factors:

- Pipe handling requirements
- Working space requirements for the tool and pipe

Procedure
1. Securely mount pipe vise (chain type) on a secure stand or workbench able to support the tool (16 lbs.), the pipe, and resist the torque (approx. 20 ft.-lb.) required to operate the tool. Pipe vise should be mounted flush with or overhanging the edge of the stand or workbench so that when the tool is mounted on the pipe, the tool will rotate freely around the pipe and not be obstructed by the bench or stand.



2. Secure pipe in pipe vise. Position the pipe to overhang the pipe vise approximately 5 - 12" as shown so that the tool can rotate in an unobstructed manner.

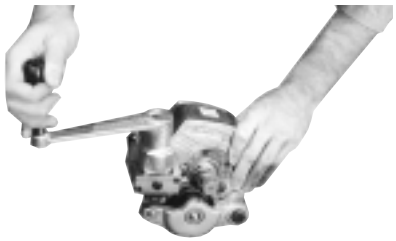
Groove-In-Place Set Up
Previously installed piping may be grooved with the VE12 providing the piping is securely supported, depressurized and drained.

⚠ CAUTION

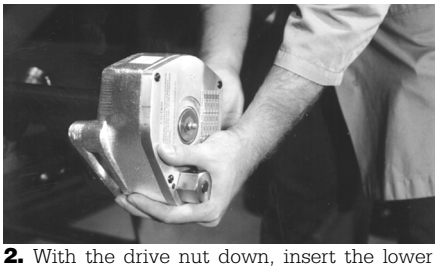
Pipe hangers must be able to accommodate the weight of the 16-lb. VE12 plus the manual effort to operate the tool (approximately 20 ft.-lb. torque) during grooving.

GROOVING OPERATION

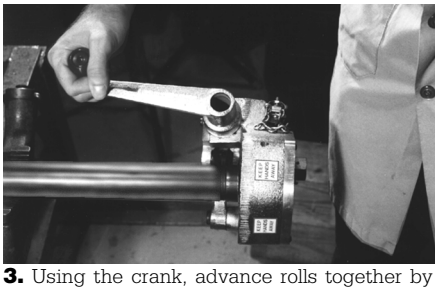
Mounting The Tool



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.



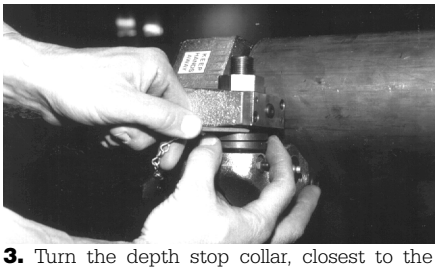
3. Using the crank, advance rolls together by turning the feed nut clockwise. Continue advancing until the grooving rolls are in light, but firm, contact with the pipe.

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 "Standard Roll Groove Specifications – Steel and Other IPS Pipe" (see page 9). For your convenience, a "C" Diameter Chart for the most common pipe sizes is also on the tools.

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 which is identified with the pipe size to be grooved.



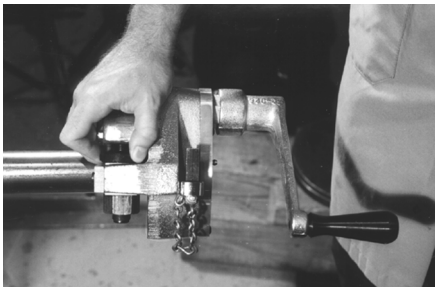
3. Turn the depth stop collar, closest to the trunnion, until the distance between the collar and the top of the trunnion is equal to the groove depth gauge thickness. Use the groove depth gauge like a feeler gauge. Turn the second collar until both are locked firmly against one another maintaining the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

4. Prepare a trial groove as described under "Grooving Operation", page 5.

5. After a trial groove is prepared and the tool is removed from the pipe, carefully check the groove diameter ("C" dimension), as charted under "Standard Roll Groove Specifications Steel and Other IPS Pipe" (see page 9). 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) always must conform to specifications under "Standard Roll Groove Specifications – Steel and other IPS Pipe", page 9 to ensure proper joint performance. Failure to do so could result in personal injury, property damage, improper installation, joint leakage or joint failure.



6. If 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" (0.068" per full turn).

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

FEED RATES

Material	Wall Thick. Inches/mm	Turns of Feed Nut to Advance the Feed
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 PROCEDURES

⚠ CAUTION

The Victaulic VE12 tool is designed only for roll grooving pipe of the appropriate sizes as listed under "Tool Rating Chart" (page 10). Grooving of pipe other than that recommended will result in improper pipe end configuration or improper groove dimensions for applying Victaulic products.

Before grooving, make sure you have followed all instructions in:

- "Pipe Preparation" (page 4).
- "Tool and Pipe Set Up and Operation" (page 4).
- "Mounting The Tool" (page 5).
- "Adjusting The Groove Depth" (page 5).

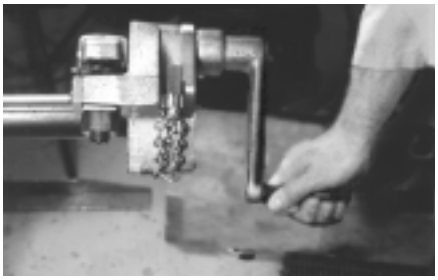
⚠ WARNING

Before operating tool, review all safety instructions on page 2. Failure to do so may result in serious personal injury.

1. Advance the feed by turning the feed nut clockwise by the amount shown in "Feed Rates", page 6. Feed rates for the VE12 vary depending on material and pipe wall thickness.

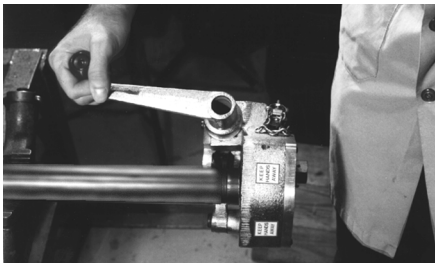
⚠ CAUTION

Over-tightening (over-feeding) will result in shortened bearing life and other tool damage. Over or under-tightening may result in the tool "walking" off the pipe and causing injury to the operator and bystanders or causing damage to the tool.



2. 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.

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

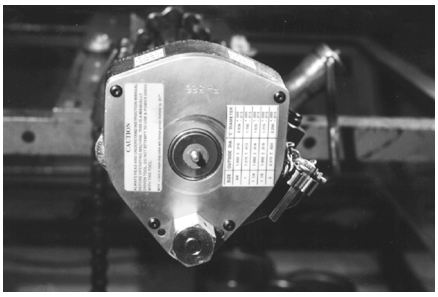


4. Advance the feed by cranking the feed nut per "Feed Rates", page 6. Crank the tool another full turn around the pipe.

Continue grooving by advancing per "Feed Rates", page 6, and 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.

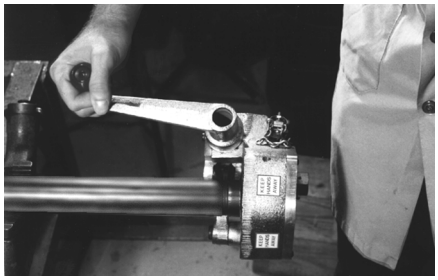
DISMOUNTING THE TOOL



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

⚠ CAUTION

Retracting feed nut loosens tool from pipe. Tool may fall off pipe while being loosened. Always hold tool on pipe while retracting feed nut.



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 tool from pipe, check groove diameter to ensure groove meets groove diameter specification.

NOTICE

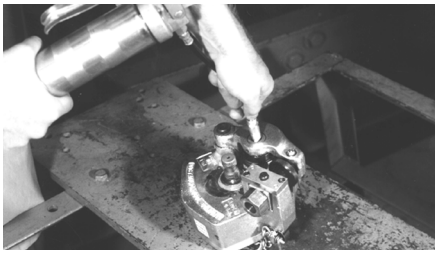
Groove Diameter should be correct for the diameter and wall thickness of pipe for which it was set under "Adjusting The Groove Depth" (page 4). Groove diameter should be checked periodically and adjusted as necessary.

MAINTENANCE

This manual provides information on keeping tools in top operating condition.

NOTICE

Remember that preventative maintenance will pay for itself in fewer repairs and safer operations.

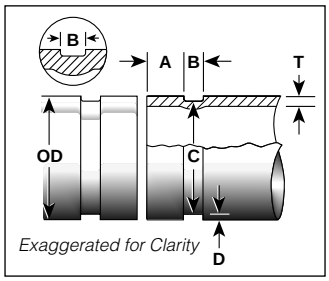


1. Lubrication:

a. After approximately eight hours of operation, grease the bearings at the two grease fittings on the tool. Use a No. 2 EP Lithium base grease.

b. 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 which hold the roll arm to the body, the feed screw to the roll arm and at trunnion pivots.

GROOVE AND PIPE DIMENSIONS



STANDARD ROLL GROOVE SPECIFICATIONS – STEEL AND OTHER IPS PIPE

0743-1A

1	2			3	4	5		6	7	8
	Dimensions – Inches/millimeters									
	Pipe Outside Diameter			Gasket Seat A ±0.03 ±0.76	Groove Width B ±0.03 ±0.76	Groove Diameter C		Groove Depth (ref.) D	Min. Allow. Wall Thk. T * Roll Groove	Max. Allow. Flare Dia.
Nom. Size Inches mm	Basic	Tolerance				Basic	Tol. +0.000 +0,00			
¾ 20	1.050 26.9	+0.010 +0.25	–0.010 –0.25	0.625 15.88	0.281 7.14	0.938 23.83	–0.015 –0.38	0.056 1.42	0.065 1.65	1.15 29.2
1 25	1.315 33.4	+0.013 +0.33	–0.013 –0.33	0.625 15.88	0.281 7.14	1.190 30.23	–0.015 –0.38	0.063 1.60	0.065 1.65	1.43 36.3
1¼ 32	1.660 42.2	+0.016 +0.41	–0.016 –0.41	0.625 15.88	0.281 7.14	1.535 38.99	–0.015 –0.38	0.063 1.60	0.065 1.65	1.77 45.0
1½ 40	1.900 48.3	+0.019 +0.48	–0.019 –0.48	0.625 15.88	0.281 7.14	1.775 45.09	–0.015 –0.38	0.063 1.60	0.065 1.65	2.01 51.1
2 50	2.375 60.3	+0.024 +0.61	–0.024 –0.61	0.625 15.88	0.344 8.74	2.250 57.15	–0.015 –0.38	0.063 1.60	0.065 1.65	2.48 63.0

* Except PVC. See “Tool Rating Chart” on page 10.

COLUMN 1 – Nominal IPS pipe size. Nominal metric (ISO) pipe size.

COLUMN 2 – IPS outside diameter. Metric (ISO) outside diameter. The outside diameter of roll grooved pipe shall not vary more than the tolerance listed. For IPS pipe, the maximum allowable tolerance from square cut ends is 0.030" for ¾ - 2" ; measured from true square line. For (ISO) metric pipe, the maximum allowable tolerance from square cut ends is 0.76 mm for sizes 20 - 50 mm.

COLUMN 3 – Gasket seat: the pipe surface shall be free from indentations, roll marks, and projections from the end of the pipe to the groove, to provide a leak-tight seal for the gasket. All loose paint, scale, dirt, chips, grease and rust must be removed. It continues to be Victaulic Tool Company’s first recommendation that pipe be square cut. When using beveled pipe, contact Victaulic for details. Square cut pipe must be used with FlushSeal® and EndSeal® gaskets. Gasket seat “A” is measured from the end of the pipe. IMPORTANT: roll grooving of beveled end pipe may result in unacceptable pipe end flare. See column 8.

COLUMN 4 – Groove width: bottom of groove to be free of loose dirt, chips, rust and scale that may interfere with proper coupling assembly. Corners at bottom of groove must be radiused. For IPS pipe, .06R on ¾ - 2". For (ISO) metric pipe, 1.5R mm on 20 - 50 mm.

COLUMN 5 – Groove outside diameter: the groove must be uniform depth for the entire pipe circumference. Groove must be maintained within the “C" diameter tolerance listed.

COLUMN 6 – Groove depth: for reference only. Groove must conform to the groove diameter “C” listed.

COLUMN 7 – Minimum allowable wall thickness: this is the minimum wall thickness which may be roll grooved.

COLUMN 8 – Maximum allowable pipe end flare diameter. Measured at the most extreme pipe end diameter square cut or beveled.

TOOL RATING CHART

0743-2A

Nominal Pipe Size Inches/mm	Steel/Alum. Inches/mm		PVC Inches/mm		Stainless Steel Inches/mm	
	Min.	Max.	Min.	Max.	Min.	Max.
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 Dimensions 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

TROUBLESHOOTING

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

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Victaulic®
An ISO 9001 certified company

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Fire Protection Division Customer Care Centers

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