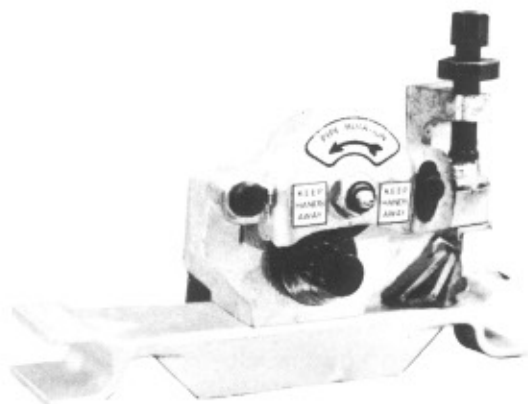


Vic-Easy® VE-226C  
for Roll Grooving Copper Tubing  
Vic-Easy® VE-226S, M & B  
for Roll Grooving Steel, Stainless  
Steel, Aluminum & PVC Pipe



## VE-226 OPERATING INSTRUCTIONS



### CAUTION

These tools are designed for roll grooving pipe/tubing. To accomplish this function requires some dexterity and mechanical skills, as well as sound safety habits.

Although these tools are manufactured for safe, dependable operation, it is impossible to anticipate those combinations of circumstances which could result in an accident. The following instructions are recommended for safe operation of the tool. Failure to follow these instructions could result in personal injury, incorrect groove dimensions or improper installation.

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## OPERATOR SAFETY INSTRUCTIONS

### CAUTION

These tools are designed for roll grooving pipe/tubing. To accomplish this function requires some dexterity and mechanical skills, as well as sound safety habits.

Although these tools are manufactured for safe, dependable operation, it is impossible to anticipate those combinations of circumstances which could result in an accident. The following instructions are recommended for safe operation of the tool. Failure to follow these instructions could result in personal injury, incorrect groove dimensions or improper installation.

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 operator's manual in a clean area and always at a readily available location. Additional copies at no charge are available upon request by writing to the Victaulic Tool Company.
2. Inspect the equipment. Prior to starting the tool, check the movable parts for any obstructions. Be certain that all tool parts are properly installed and secured.
3. Prevent accidental startings. Place switch on the attached power drive in the "OFF" position prior to plugging in unit. Use a foot pedal control for the power drive.
4. Ground the Power Drive.
5. Operate on foot switch side only. Tool must be operated with a control located for easy operator access. Never reach across moving parts or material being worked on. Switch should always be accessible to operator.
6. These tools are designed ONLY for roll grooving of copper tubing sizes, materials and wall thicknesses outlined under Drawn Copper tubing Dimensions and IPS pipe sizes listed under "Steel, Stainless Steel, Aluminum, and PVC Pipe Dimensions", (pages 13 and 14).
7. Secure tool, drive equipment and work. Make certain that the power drive is secured to the floor or otherwise capable of resisting the full output torque of the power drive (consult drive manufacturer's operating instructions) and the weight of the tubing or pipe being grooved.
8. Support Work. Support long tubing or pipe with a pipe support secured to the floor.

9. Do not misuse tool. Perform only the functions for which the tool is designed. Do not overload the tool.
10. Disconnect power cord prior to servicing. Repair should be attempted only by authorized personnel. Always disconnect power cord or power drive before servicing or making any adjustments.
11. Use recommended accessories. Consult the Operator's Manual. Use of improper accessories may be hazardous.
12. Maintain machine in top condition. Keep machine clean for best and safest performance. Follow lubricating instructions.
13. Don't force machine. It will do the job better and be safer at the rate for which it was designed.
14. Wear proper apparel. No loose clothing (unbuttoned jackets or loose sleeve cuffs) or jewelry to get caught in moving parts.
15. Don't overreach. Keep your proper footing and balance at all times. Do not reach across machine or pipe/tubing. Keep hands and loose tools away from moving elements.
16. Use safety glasses and footwear.
17. Avoid dangerous environments. Don't use the machine in damp or wet locations. Keep work area well illuminated. Allow sufficient space to operate machine and accessories properly and for others to pass safely.
18. Keep work area clean. Cluttered areas, benches and slippery floors invite accidents.
19. Wear ear protection if exposed to long periods of very noisy shop operations.
20. Keep visitors away. All visitors should be kept a safe distance from the work area.
21. Keep alert. Do not operate machine if ill or drowsy from medication or fatigue. Avoid horseplay around equipment and keep bystanders a safe distance from equipment.
22. Do not operate tool at speeds exceeding those specified under "Power Drive", (page 4).

## INTRODUCTION

Victaulic VE-226 tools are manual feed tools for roll grooving of tubing or pipe to prepare it to receive Victaulic grooved couplings.

This tool is designed to properly roll groove tubing or pipe of various types within the size range and wall thickness shown in the Drawn Copper Tubing Dimensions chart or the IPS Steel, Stainless Steel, Aluminum, and PVC Pipe Dimensions chart, (pages 13 and 14). The tool should **only** be used for roll grooving tubing or pipe designated in the charts. Use of the tool for other purposes or exceeding the tubing or pipe wall thickness maximums will overload the tool, shorten tool life and may cause damage.

See Figure 1 for the machine used within this manual.

## RECEIVING TOOL

VE-226 Tools are individually packaged in heavy cardboard containers.

Upon receipt, check to be certain the tool is the correct model and all necessary parts are included. Included should be:

- (1) Vic-Easy 226 Tool
- (1) Set of feeler gauges (attached)
- (1) Allen wrench (attached)
- (2) Operating Instruction Manuals
- (2) Spare shear pins

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

## POWER DRIVE

VE-226 tools are designed for power operation. Tools mount directly on a Ridgid-300® Power Drive, 40 rpm maximum speed. Mounts for other power drives are available, consult Victaulic Tool Company for information. Consult drive manufacturer's instructions for proper operation.

## POWER REQUIREMENTS

Power must be supplied through a safety foot switch to assure safe operation. Be certain the power drive (Ridgid-300®) is properly grounded in accordance with Article 250 of the National Electrical Code. If an extension cord is to be used, be certain it is of the proper size. Always consult drive manufacturer's instructions prior to use.

## TOOL SET-UP AND ADJUSTMENT

### A. TOOL SET-UP

Before grooving, the tool must be mounted on a Ridgid-300® Power Drive or equivalent power drive. The power drive must be placed on level ground and secured to a platform or to the floor. See Operator Safety Instructions #7.

### CAUTION

Before setting up and operating Victaulic pipe preparation tools, read and understand the Operator's Instruction Manual supplied with each tool. Additional copies are available at no charge from Victaulic Tool Company.

Learn the operation, application and potential hazards peculiar to this tool.

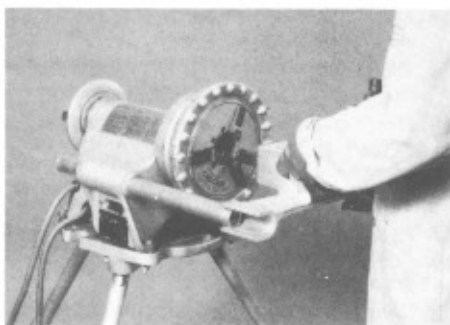
Failure to do so could result in personal injury, property damage, improper installation, joint leakage or joint failure.

**NOTE: Do not connect power until step 8.**

1. Select location for tool. The choice of tool location and position should take into account the following factors:
  - a. Pipe handling support requirements.
  - b. Power supply requirements.
  - c. Pipe support and tool anchoring requirements.
2. Prepare the power drive unit to receive the VE-226 tool. Remove threading dies, cut off attachments, etc. from the power drive. Extend the two (2) tubular arms

approximately 6½" beyond the power drive chuck. Secure the support arms in this position. (Consult power drive manufacturer's instructions.)

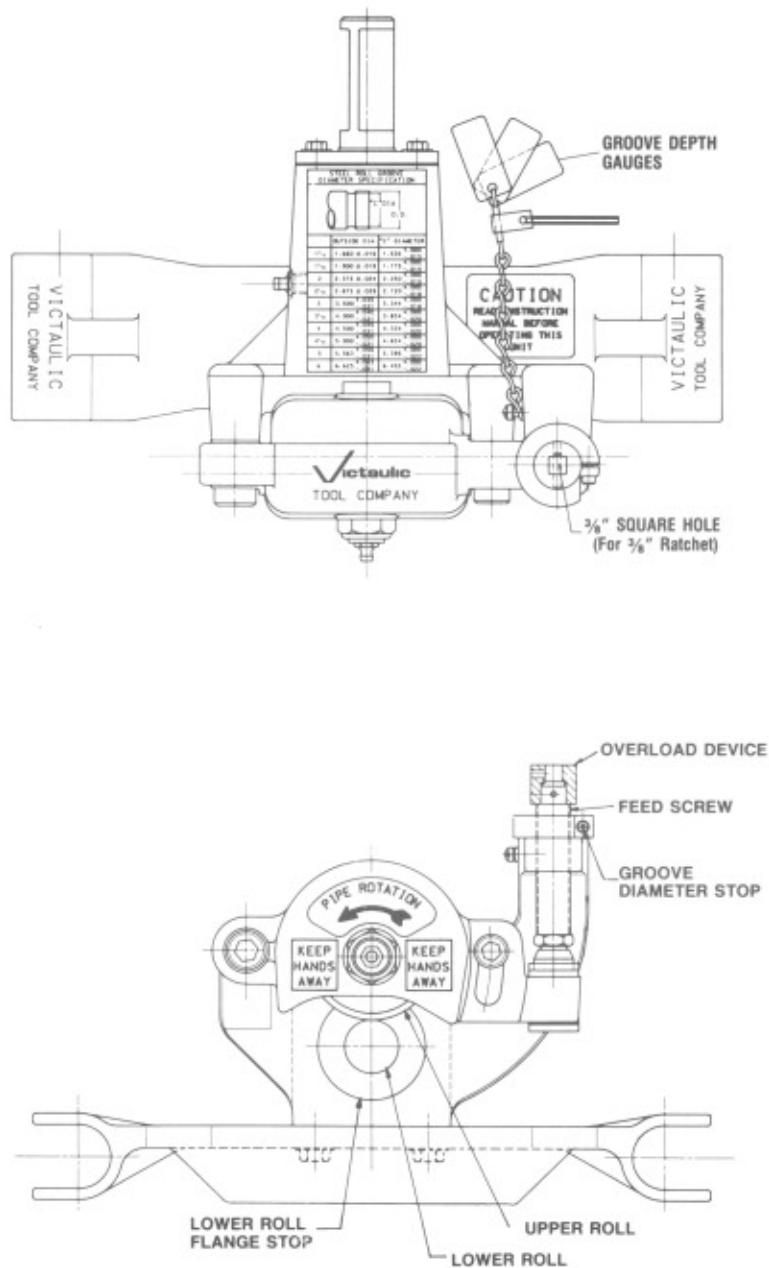
3. Secure the power drive to the floor or platform and level the unit. See Operator Safety Instructions #7.
4. Fully open the power drive chuck.



5. Slide the two (2) "C" shaped ends on the tool base over the tubular arms on the Ridgid® 300 Power Drive and engage rear of shaft into chuck.
6. Align the notched flats on the tool drive shaft with the jaws on the power drive chuck.
7. Tighten the chuck, making sure the jaws fit in the drive shaft notched flats.

# TOOL NOMENCLATURE

Figure 1



8. Make sure power drive is in its "OFF" position. Plug the power drive into an internally grounded electrical outlet. The outlet must meet the power requirements for the power drive.

### WARNING

The power drive must not be operated without a safety foot switch, as the operator will require it to operate the tool safely.

9. Turn the power drive switch to the position that will produce **counterclockwise** rotation of the chuck when viewed from the front of the tool. Depress foot switch and check rotational direction and tool stability. If rotation is clockwise, reverse power drive switch. If tool wobbles, check to make certain tool is mounted properly in chuck and tool is level. If the wobble cannot be eliminated, the power drive support arms are bent, or the power drive is damaged. Take the necessary steps to have power drive repaired if wobble persists.

VE-226 tool set-up is complete.

### B. TUBING/PIPE PREPARATION

For satisfactory tool operation the following tubing preparation tips should be carefully observed:

1. Tubing/pipe must be square cut (See note Column 2 under the Drawn Copper Tubing Groove Specifications or Steel Pipe Groove Specifications on page 12 and 14).
2. The end of the tubing/pipe both inside and out should be cleaned of coarse scale, dirt or other materials which might interfere with or damage the Grooving Rolls or distort the groove.

### C. TUBING/PIPE LENGTH

The chart below lists the minimum length of tubing or pipe to be grooved and the maximum length to be grooved without a support.

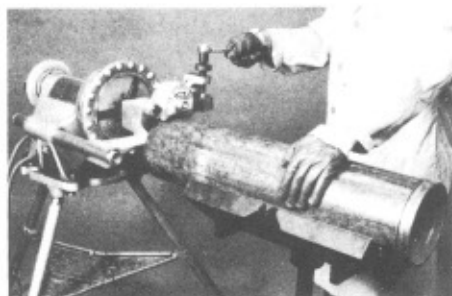
Groovable Pipe Lengths — (Inches)

Nom. Size	Min. Length	Max. Length	Nom. Size	Min. Length	Max. Length
1¼	8	36	4	8	36
1½	8	36	4½	8	32
2	8	36	5	8	32
2½	8	36	6 O.D.	10	30
3	8	36	6	10	28
3½	8	36			

Note: The above chart applies to all tube and pipe materials and wall thicknesses. Pipe or tubing longer than that shown as maximum must be supported with an appropriate pipe stand. See "Tubing/Pipe Support".

### D. TUBING/PIPE SUPPORT

Tubing or pipe longer than the maximum lengths listed above must be supported and kept in line with a well secured V-rest roller-type stand, positioned at a point slightly beyond one-half the tubing/pipe length from the tool.



The V-rest **must** be firmly positioned so that the tubing/pipe will be **level**, or not more than ½° below level with the tubing/pipe end resting on the tool's lower roll. The tubing/pipe support must be moved about ½° to the right, facing the tool at the outer edge of the tubing/pipe. This angle is necessary for the tubing/pipe to track properly which holds the tubing/pipe securely against the flange stop on the lower roll while grooving. (Refer to Figures 2 and 3.)

**If a burr or flare forms at the tubing/pipe end, the angle is too great and should be reduced or the tubing/pipe is above horizontal and should be lowered to a level position.**

If the angle is not sufficient, the tubing/pipe will tend to draw away from the flange stop.

OPERATE TOOL FROM THIS SIDE

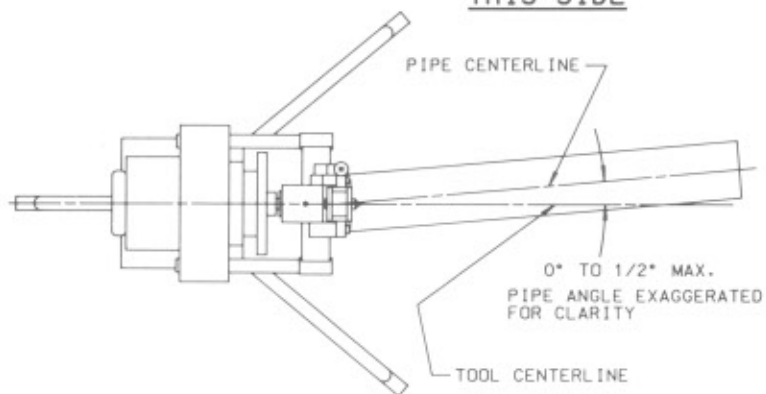


FIGURE 2

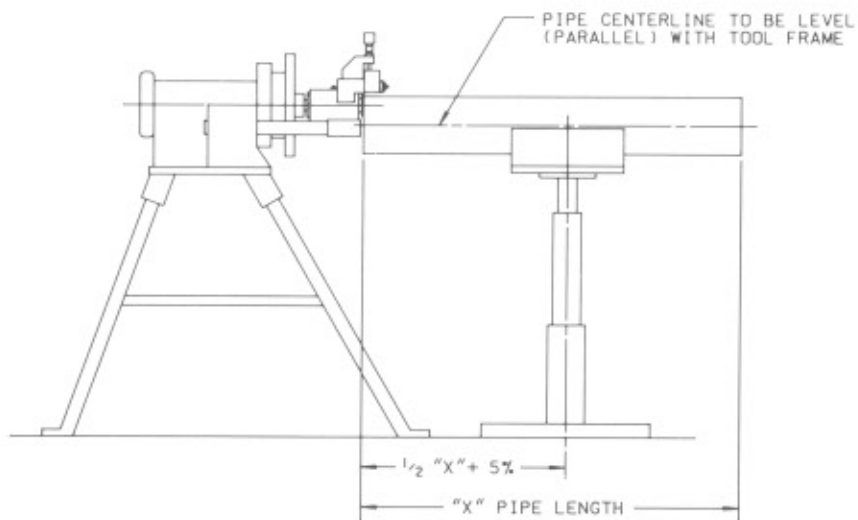


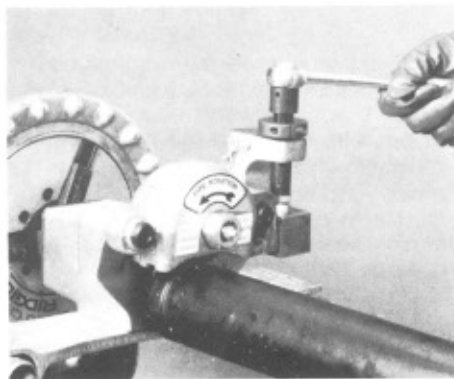
FIGURE 3

## E. GROOVE DIAMETER STOP SETTING

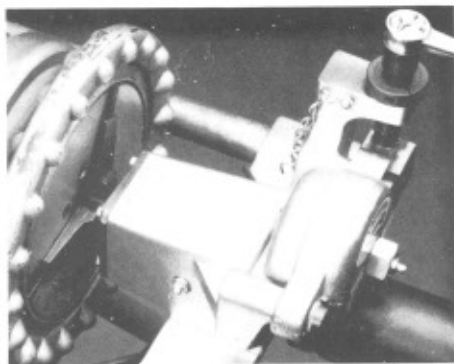
**NOTE:** To perform the following adjustments, several short scrap sections of tubing/pipe of the proper size and wall thickness to be grooved should be used.

The Groove Diameter Stop must be adjusted for each tubing/pipe size or change in wall thickness. Groove diameter, identified as the "C" dimension for each tubing/pipe size, is listed under Drawn Copper Tubing Groove Specifications or Steel Pipe Groove Specifications (pages 12 and 14). For your convenience, a "C" Diameter Chart for the most common pipe sizes is also on the tool.

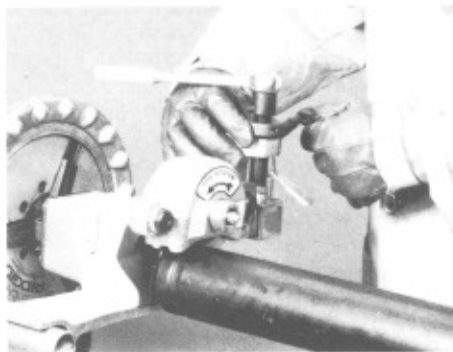
1. Using a  $\frac{3}{8}$ " square drive ratchet (not supplied), retract the feed screw/upper roll to a distance such that the tubing/pipe can be fully slipped over the lower roll.
2. Using a piece of short tubing/pipe or scrap tubing/pipe of the same diameter and wall thickness as the tubing/pipe to be grooved, insert the tubing/pipe over the lower roll with the tubing/pipe against the lower roll flange stop.



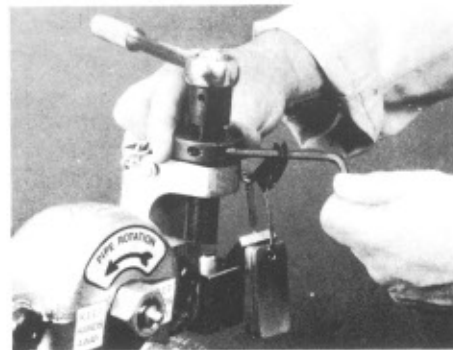
3. Again using the ratchet, advance the feed screw to put the upper roll into light, but firm, contact with the outside surface of the tubing/pipe. The groove diameter stop should be adjusted upward sufficiently so the proper downward travel of the upper roll is attainable.



4. Locate the groove depth gauge attached to the machine which is identified with the tubing/pipe size to be grooved.

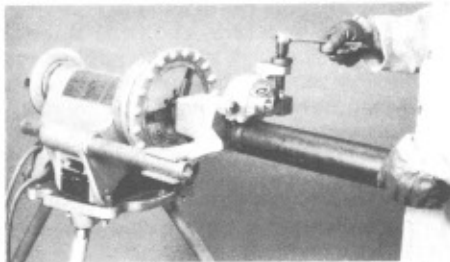


5. Using the  $\frac{3}{16}$ " hex wrench supplied with the tool, loosen and adjust the groove diameter stop until the distance between the stop and the hex nut on top of the machine is equal to the groove depth gauge thickness. Use the groove depth gauge like a feeler gauge.

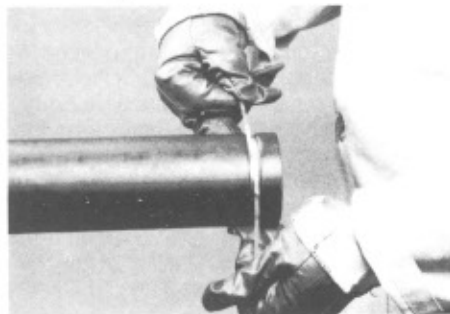


6. Using the  $\frac{3}{16}$ " hex wrench, lock the diameter stop to the feed screw maintaining adjustment from step 5.





7. Prepare a trial groove as described under Grooving Procedures.



8. After a trial groove is prepared and tubing/pipe removed from the tool, carefully check the groove diameter ("C" dimension), as charted under Drawn Copper Tubing Groove Specifications or Steel Pipe Groove Specifications (page 12 and 14). The "C" dimension is best checked with a Pi-tape. It may also be checked with a vernier caliper or narrow-land micrometer at two locations, 90° apart, around the groove. Average reading must equal the required Groove Diameter.

**NOTE: The "C" dimension, groove diameter, must always conform to specifications (page 12 and 14).**

9. If groove diameter ("C" dimension) is not within tolerance, the diameter stop must be adjusted to obtain the proper dimension. **To decrease** groove diameter (increase groove depth) turn the diameter stop **counterclockwise**. **To increase** groove diameter (decrease groove depth), turn diameter stop **clockwise**. A quarter turn either way will change the groove diameter by .013" (.051 per full turn).
10. Prepare another trial groove and check the groove diameter again (Steps 8 & 9). Repeat until groove diameter is within tolerance.

## F. GROOVING OPERATION

**NOTE: Vic-Easy Series 226 tools are designed ONLY for roll grooving tubing/pipe of the appropriate sizes (pages 13 and 14). Grooving of tubing/pipe other than that recommended will not produce grooves of proper tubing/pipe end configuration or groove dimensions for applying Victaulic products.**

Before grooving, check to be certain tool is properly set up as detailed under Tool Set-Up.

### CAUTION

Before setting up and operating Victaulic pipe preparation tools, read and understand the Operator's Instruction Manual supplied with each tool. Additional copies are available at no charge from Victaulic Tool Company.

Learn the operation, application and potential hazards peculiar to this tool.

Failure to do so could result in personal injury, property damage, improper installation, joint leakage or joint failure.

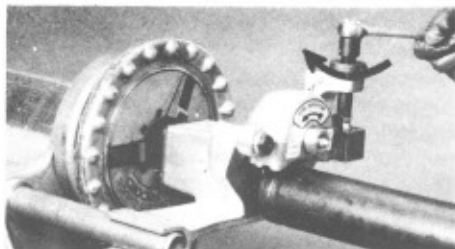
1. Plug power drive into an internally grounded electrical source. Be certain power drive is grounded.
2. Tool must be operated with a Safety Foot Pedal Switch. Actuate switch by pressing foot on pedal to be certain tool is operational and power supply is available.

### CAUTION

Keep fingers, clothes, hair and objects other than tubing/pipe away from rotating tools. Use safety glasses and footwear.

3. Using a  $\frac{3}{8}$ " square drive ratchet (not supplied), rotate the feed screw **counterclockwise** to move the upper roll to the full up position.
4. Slide the tubing/pipe over the lower roll until the tubing end is flush against the lower roll flange stop.

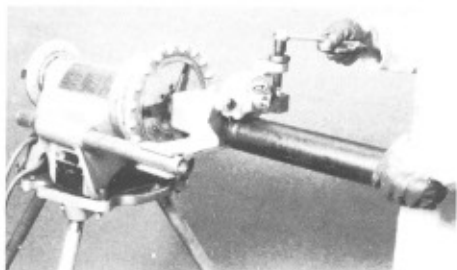
**NOTE: If grooving a long length, check to be certain tubing/pipe is level and properly supported as detailed under Tubing/Pipe Support.**



5. Rotate the feed screw **clockwise** to bring the upper roll into light, but firm, contact with the tubing/pipe.

**NOTE: Be certain the groove diameter stop has been set to the proper groove diameter ("C" dimension). See Groove Diameter Stop Setting (page 8).**

6. If grooving a short piece of tubing/pipe (8" minimum length) pull the tubing/pipe to the right and downward with your left hand. Do not lift up on the tubing/pipe or push it to the left, as the tubing/pipe will not track and may spin (walk) out of the rolls. To initiate power, depress and hold down the safety foot pedal switch. This will produce rotation of the lower roll which serves to rotate the tubing/pipe, which in turn rotates the upper roll.
7. **Before Grooving**, check the tracking of the tubing/pipe as it rotates to be certain it remains snug against the lower roll flange stop. If it does not, stop the tool rotation by releasing the safety pedal switch and check to be certain tubing/pipe is level and properly positioned and the tubing/pipe is turning counter-clockwise.



8. As the tubing/pipe rotates, begin grooving by slowly rotating the feed screw **clockwise** using a  $\frac{3}{8}$ " square drive ratchet. Groove copper tubing and light-wall pipe at a moderate rate by uniformly forming grooves in 5 to 10 tube/pipe rotations. Schedule 40 pipe will require more revolutions to reach proper grooving depth.

**NOTE: A shear pin is used to connect the drive socket to the feed screw. Should excessive force be applied to the  $\frac{3}{8}$ " ratchet, the spring pin will shear, thereby preventing damaging forces from being applied to the machine components. The machine is designed to easily accommodate normal grooving forces, so shearing the pin should not normally occur. However, should a pin shear, determine the cause for shearing, (see "Trouble Shooting" section) correct the problem, and replace the sheared pin with a spare pin (supplied).**

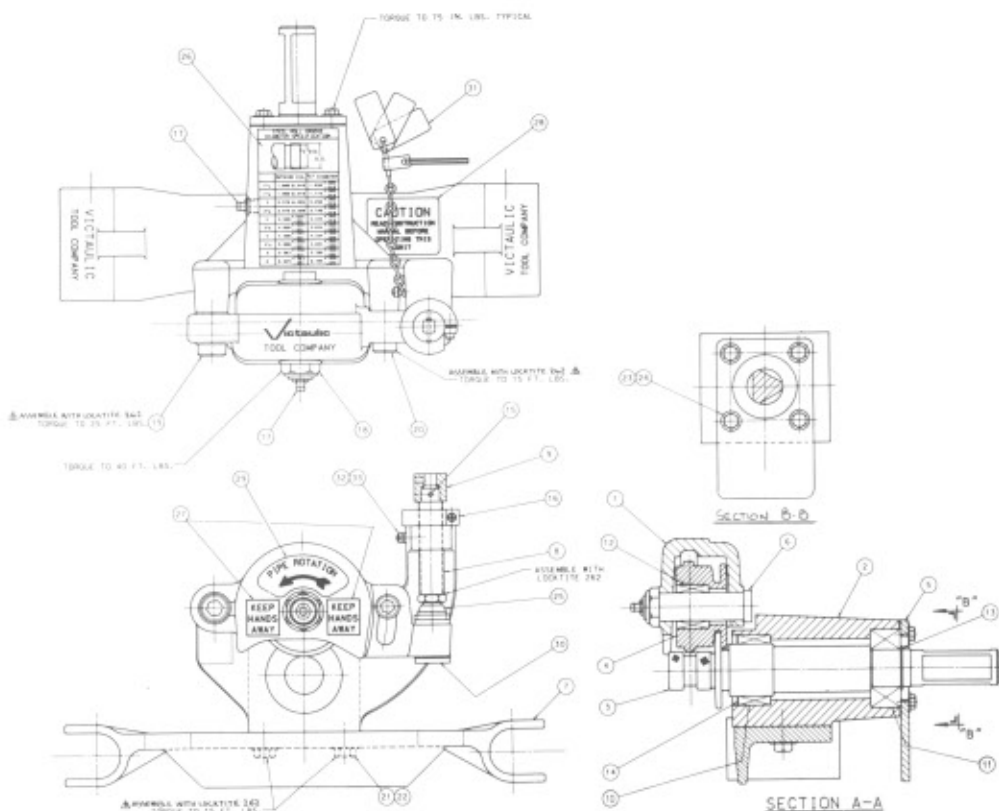
9. Continue grooving until the groove diameter stop comes into full, firm contact with the top of the machine body. Continue tubing/pipe rotation for several revolutions to assure groove completion.
10. Release safety pedal switch and retract feed screw/upper roll. When tubing/pipe has stopped rotating, it may be removed from the machine.

**NOTE: Groove Diameter should be correct for the diameter and wall thickness of tubing/pipe for which it was set under Groove Diameter Stop Setting procedures. Groove diameter should be checked periodically and adjusted as necessary.**

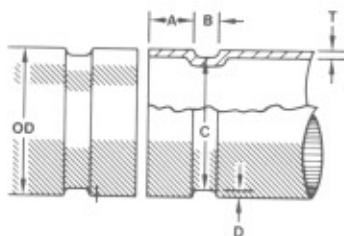
## G. MAINTENANCE

1. Keep machine clean for best and safest performance.
2. **Lubrication: Adequate lubrication is essential for satisfactory performance of the machine.**
  - a. After approximately every 2 hours of operation, apply a No. 2 EP Lithium base grease to the feed screw. Apply by hand to the screw threads or through the grease fitting at this location. Keep this screw generously lubricated to ensure a long service life. Also apply grease underneath the toggle pad, to the ball and socket joint of the toggle pad, and to the locations where the roll arm slides against the body. Apply a light oil (SAE 10W-30, 3-in-1, or equivalent) to the shoulder bolts which hold the roll arm to the body.
  - b. After approximately every 8 hours of operation, grease the bearings at the two grease fittings provided for this purpose.

# VE-226 PARTS LIST



Item	Qty.	Description	Part No.	Item	Qty.	Description	Part No.
1	1	Roll Arm	R0152260FS	19	1	Socket Shoulder Screw Vlier SHSS24	NS05100100
2	1	Body	R0132260FS	20	1	Socket Shoulder Screw Vlier SHSS20C	NS05080100
3	1	Lower Roll Steel	R901226L06	21	2	Nylon Insert or Patch Hex Hd. Screw 3/8-16x1" lg.	NS35060100
	1	Lower Roll Copper (only)	RR02226L06	22	2	Washer 3/8 USS	NW02060000
4	1	Upper Roll Steel	R901226U06	23	4	Hex Hd. Screw 1/4-20x3/4 lg.	NS01040012
	1	Upper Roll Copper (only)	RR02226U06	24	4	Washer 1/4 SAE	NW06040000
5	1	Bearing Retainer	R0052260FS	25	1	Toggle Pad Vlier P306-118	R0112260FS
6	1	Upper Roll Shaft	R0122260FS	26	1	Label-Steel Groove Specs	R0242260FS
7	1	Torque Arm	R0162260FS		1	Label-Copper Groove Specs	R0232260FS
8	1	Feed Screw	R0172260FS	27	2	Label-Keep Hands Away	R0272260FS
9	1	Drive Socket	R0182260FS	28	1	Label-Caution Read Instruction	R017296PCT
10	1	Bearing McGill MR26N (or equal)	NB02162001	29	1	Label-Pipe Rotation	R0262260FS
11	1	Bearing #5206 20°-30° Contact Angle & 1 Seal	NB01118001	30	1	Roll Arm Lifter	R0192260FS
12	1	Bearing McGill MR14 (or equal)	NB02087001	31	1	Groove Depth Gauge Assy.	R0302260FS
13	1	Snap Ring IRR 3100-118 Car Spg Stl	NT03000009		1	Groove Depth Gauge Assy. (copper)	R0312260FS
14	1	Snap Ring Smalley VH218 Car Spg Stl	NT03000008	32	1	Slot Fillister Hd. Scr. #10-24x1/2 lg.	NS12010008
15	1	Shear Pin	R0252260FS	33	1	Washer #10 SAE	NW06010000
16	1	Locking Collar	R0212260FS				
17	2	Straight Grease Fitting 1/8 NPT	NM01000002				
18	1	3/4-16 Nylon ins. Locknut thin	NN14120000				



## Standard Roll Groove Specifications - Steel and Other IPS Pipe

1 Nom. Size Inches	2 Pipe Outside Dia. O.D.			3 Gasket Seat A $\pm 0.03$	4 Groove Width B $\pm 0.03$	5 Groove Dia. C		6 Groove Depth (ref. only) D	7 Min. Allow. Wall Thk. T	8 Max. Allow. Flare Dia.
	Basic	Tolerance				Basic	Tol. $+0.000$			
		+	-							
1¼	1.660	+0.016	-0.016	0.625	0.281	1.535	-0.015	0.063	0.065	1.77
1½	1.900	+0.019	-0.019	0.625	0.281	1.775	-0.015	0.063	0.065	2.01
2	2.375	+0.024	-0.024	0.625	0.344	2.250	-0.015	0.063	0.065	2.48
2½	2.875	+0.029	-0.029	0.625	0.344	2.720	-0.018	0.078	0.083	2.98
3 O.D.	3.000	+0.030	-0.030	0.625	0.344	2.845	-0.018	0.078	0.083	3.10
3	3.500	+0.035	-0.031	0.625	0.344	3.344	-0.018	0.078	0.083	3.60
3½	4.000	+0.040	-0.031	0.625	0.344	3.834	-0.020	0.083	0.083	4.10
4	4.500	+0.045	-0.031	0.625	0.344	4.334	-0.020	0.083	0.083	4.60
4½	5.000	+0.050	-0.031	0.625	0.344	4.834	-0.020	0.083	0.095	5.10
5½ O.D.	5.500	+0.056	-0.031	0.625	0.344	5.334	-0.020	0.083	0.109	5.60
5	5.563	+0.056	-0.031	0.625	0.344	5.395	-0.022	0.084	0.109	5.66
6 O.D.	6.000	+0.056	-0.031	0.625	0.344	5.830	-0.022	0.085	0.109	6.10
6½ O.D.	6.500	+0.063	-0.031	0.625	0.344	6.330	-0.022	0.085	0.109	6.60
6	6.625	+0.063	-0.031	0.625	0.344	6.455	-0.022	0.085	0.109	6.73

COLUMN 1 — Nominal IPS pipe size.

COLUMN 2 — IPS 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 1¼" through 3½" and 0.045" for 4" through 6".

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 leaktight seal for the gasket. All loose paint, scale, dirt, chips, grease and rust must be removed.

It continues to be Victaulic's first recommendation that pipe be square cut. Beveled pipe may be used provided the wall thickness is standard wall (ANSI B36.10) or less and the bevel meets ANSI B16.25 (37½°). Square cut pipe must be used with Flush-Seal 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.

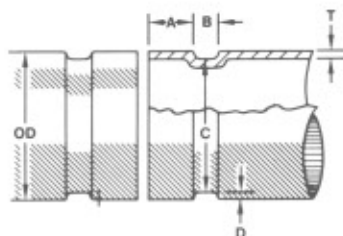
COLUMN 4 — Groove width: Bottom of groove to be free from loose dirt, chips, rust and scale that may interfere with proper coupling assembly.

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 nominal 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 AND ROLL SELECTION

Nom. Pipe Size (Inches)	Metallic Pipe						Plastic Pipe	
	1 Steel Pipe Wall Thickness		2 Stainless Steel Wall Thickness		3 Aluminum Pipe Wall Thickness		4 PVC Plastic Tubing Wall Thick.	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.

### VE-226B

¾	0.065	0.113	0.065	0.113	0.065	0.113	0.113	0.113
1	0.065	0.133	0.065	0.133	0.065	0.133	0.133	0.179
1¼	0.065	0.140	0.065	0.140	0.065	0.140	0.140	0.191
1½	0.065	0.145	0.065	0.145	0.065	0.145	0.145	0.200

### VE-226S

1¼	0.065	0.140	0.065	0.140	0.065	0.140	0.140	0.191
1½	0.065	0.145	0.065	0.145	0.065	0.145	0.145	0.200
2	0.065	0.154	0.065	0.154	0.065	0.154	0.154	0.218
2½	0.083	0.203	0.083	0.203	0.083	0.203	0.203	0.276
3 O.D.	0.083	0.120	0.083	0.120	0.083	0.120	—	—
3	0.083	0.120	0.083	0.120	0.083	0.120	0.216	0.216
4 O.D.	0.083	0.120	0.083	0.120	0.083	0.120	—	—
4	0.083	0.120	0.083	0.120	0.083	0.120	0.237	0.237
4½	0.095	0.134	0.095	0.134	0.095	0.134	—	—
5	0.109	0.134	0.109	0.134	0.109	0.134	0.258	0.258
6 O.D.	0.109	0.134	0.109	0.134	0.109	0.134	—	—
6	0.109	0.134	0.109	0.134	0.109	0.134	0.280	0.280

### VE-226M

2	0.065	0.154	0.065	0.154	0.065	0.154	0.154	0.218
2½	0.083	0.203	0.083	0.203	0.083	0.203	0.203	0.276
3 O.D.	0.083	0.216	0.083	0.216	0.083	0.216	—	—
3	0.083	0.216	0.083	0.216	0.083	0.216	0.216	0.216
4 O.D.	0.083	0.237	0.065	0.237	0.083	0.237	—	—
4	0.083	0.237	0.083	0.237	0.083	0.237	0.237	0.237
4½	0.109	0.188	0.095	0.134	0.095	0.134	—	—
5	0.109	0.188	0.109	0.134	0.109	0.134	0.258	0.258
6 O.D.	0.109	0.188	0.109	0.134	0.109	0.134	—	—
6	0.109	0.188	0.109	0.134	0.109	0.134	0.280	0.280

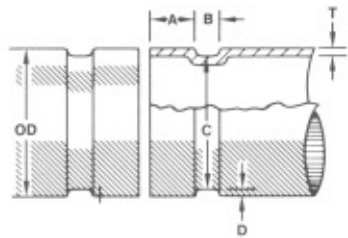
COLUMN 1 — Maximum ratings on steel are limited to pipe of 180 BHN (Brinnel Hardness Number) and less

COLUMN 2 — Types 304 and 316

COLUMN 3 — Alloys 6061-T4 and 6063-T4

COLUMN 4 — PVC Type I Grade I - PVC1120; PVC Type I Grade II - PVC1220; PVC Type II Grade I - PVC 2116

All wall thicknesses are nominal minimum and maximums.



## Drawn Copper Tubing Dimensions (Inches)

The VE-226C is rated for the following copper tube:

Nominal Tube Size	Outside Diameter	Nominal Wall Thickness			
		DWV ASTM B-306	Type "M" ASTM B-88	Type "L" ASTM B-88	Type "K" ASTM B-88
2	2.125	—	0.058	0.070	0.083
2½	2.625	—	0.065	0.080	0.095
3	3.125	0.045	0.072	0.090	0.109
4	4.125	0.058	0.095	0.110	0.134
5	5.125	0.072	0.109	0.125	0.160
6	6.125	0.083	0.122	0.140	0.192

## Drawn Copper Tubing Groove Specifications

1 Nom. Size Inches	2 Tube Outside Dia. O.D.		3 Gasket Seat A ±0.03	4 Groove Width B +0.03 -0.00	5 Groove Dia. C +0.00 -0.02	6 Groove Depth (ref.) D	7 Min. Allow. Wall Thk. T	8 Max. Allow. Flare Dia.
	Basic	Tol.						
2	2.125	±0.002	0.610	0.300	2.029	0.048	0.064	2.220
2½	2.625	±0.002	0.610	0.300	2.525	0.050	0.065	2.720
3	3.125	±0.002	0.610	0.300	3.025	0.050	DWV	3.220
4	4.125	±0.002	0.610	0.300	4.019	0.053	DWV	4.220
5	5.125	±0.002	0.610	0.300	5.019	0.053	DWV	5.220
6	6.125	±0.002	0.610	0.300	5.999	0.063	DWV	6.220

COLUMN 1 — Nominal ASTM B-88 drawn copper tubing size.

COLUMN 2 — Outside diameter. The outside diameter roll grooved tubing shall not vary more than the tolerance listed. The maximum allowable tolerance from square cut ends is 0.030" for 2" through 3"; 0.045" 4" through 6", measured from true square line.

COLUMN 3 — Gasket seat: the tubing surface shall be free from indentations, roll marks, and projections from the end of the tubing to the groove, to provide a leak-tight seal for the gasket. All loose scale, dirt, chips and grease must be removed.

COLUMN 4 — Groove width: bottom of groove to be free of loose dirt, chips, and scale that may interfere with proper coupling assembly.

COLUMN 5 — Groove outside diameter: the groove must be uniform depth for the entire tubing 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 — ASTM B-306 drain waste and vent (DWV) is minimum wall thickness copper tubing, which may be roll grooved, in 3" through 6" sizes.

COLUMN 8 — Maximum allowable end flare diameter. Measured at the most extreme tubing end diameter.

## TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Tubing/pipe will not stay in grooving rolls.	<p>Incorrect tubing/pipe positioning.</p> <p>Improper manual grooving technique.</p> <p>Power drive running clockwise.</p>	<p>See "Pipe Support".</p> <p>See "Grooving Operation."</p> <p>See "Tool Setup".</p>
Tubing/pipe stops rotating during grooving.	<p>Rust or dirt has built up on lower roll.</p> <p>Worn grooving rolls</p> <p>Power drive chuck is not properly engaged into drive shaft notched flats.</p> <p>Circuit breaker has tripped or fuse has blown on electrical circuit supplying tool.</p>	<p>Remove accumulation from lower roll with stiff wire brush.</p> <p>Inspect lower roll for worn knurls, replace if worn.</p> <p>See "Tool Set-up".</p> <p>Reset breaker or replace fuse.</p>
Tubing/pipe flare is excessive.	<p>Tubing/pipe support adjusted too high.</p> <p>Tool/power drive is tilted forward.</p> <p>Incorrect tubing/pipe support positioning, tubing/pipe is over "tracking".</p>	<p>See "Pipe Support".</p> <p>See "Tool Set-up".</p> <p>Move tubing/pipe support to left. See "Tubing/Pipe Support".</p>
Tool won't groove tubing/pipe.	<p>Tubing/pipe beyond tool's wall thickness and capability.</p> <p>Tubing/pipe material incorrect or too thick.</p>	<p>See "Drawn Copper Tubing Dimensions" or "Steel, Stainless Steel, Aluminum and PVC Pipe Dimensions".</p> <p>Use correct material.</p>
Shear pin has broken.	<p>Rolls fed too fast.</p> <p>Pipe wall thickness excessive or pipe too hard.</p> <p>Feed mechanism is binding, damaged or insufficiently lubricated.</p>	<p>Replace pin and groove at slower rate.</p> <p>Replace pin and obtain pipe within the tool's capacity.</p> <p>Repair as required.</p>

## VICTAULIC TOOL COMPANY

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