
VG412

Pipe Cut Grooving Tool



! WARNING



Failure to follow instructions and warnings can result in serious personal injury.

- Before installing, operating, or servicing this tool, read this manual and all warning labels on the tool.
- Always wear safety glasses and foot protection.

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

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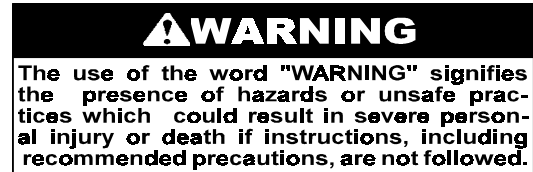
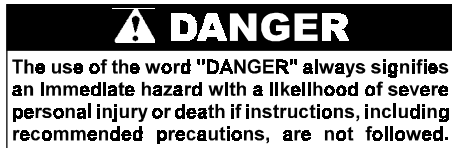
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HAZARD IDENTIFICATION

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.



OPERATOR SAFETY STRUCTIONS

This tool is designed only for cut grooving pipe. To accomplish this function requires some dexterity and mechanical skills, as well as sound safety habits. Although this tool is 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. The operator is cautioned to always practice "Safety First" during each phase of use, including setup and maintenance of this unit. **It is the responsibility of the owner, lessee or user of this tool to ensure that all operators receive, read and understand this manual and are fully trained to operate this tool.**

GENERAL

1. **Read and understand this 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 this manual in a clean area and always at a readily available location. Additional copies at no charge are available upon request by writing or phoning the Victaulic Tool Company.
2. **Use only recommended accessories.** Use of improper accessories may be hazardous. See Accessories on page 40.
3. **This tool is designed ONLY for cut grooving of pipe sizes, materials and wall thicknesses outlined under Tool Rating on page 8 and Tool Bit Selection on page 38.**

TOOL SET-UP

1. **Ground the Power Drive.** Be sure the power drive is connected to an internally grounded electrical system.
2. **Avoid dangerous environments.** Don't use the machine in damp or wet locations. Don't use the tool on sloped or uneven ground or floor. Keep work area well illuminated. Allow sufficient space to operate tool and accessories properly and for others to pass safely.
3. **Prevent back injury.** During tool set-up, one person cannot safely handle the tool assembly because it weighs 145 lbs (66kg). Two people are needed to safely handle the assembly. If a hoist is available use it to lift the tool assembly into position.
4. **Only use power drive supplied with tool.** Use of a different power drive may result in personal injury, poorly cut pipe ends or grooves and damage to the tool.
5. **Pipe must be properly prepared** in accordance with Victaulic pipe preparation specifications.

OPERATING TOOL

1. **Inspect the equipment.** Prior to starting the tool, check the movable parts for any obstructions. Be sure that guards and tool parts are properly installed and adjusted.
2. **Prevent accidental startings.** Un-plug the tool when making adjustments and performing maintenance.
3. **Operate with foot switch only.** The power drive must be operated with a safety foot switch as the operator will require it to operate the tool safely.
4. **Keep hands away from tool holders and gears during operation.** Tool holders and gear can crush or cut fingers and hands.
5. **Never reach inside pipe ends during operation.**
6. **Do not over reach.** Keep your proper footing and balance at all times. Be sure you can reach foot switch safely at all times. Do not reach across tool or pipe. Keep hands and loose tools away from moving parts.
7. **Wear safety glasses and footwear.**
8. **Keep work area clean.** Cluttered areas, benches and slippery floors invite accidents.
9. **Wear ear protection if exposed to long periods of very noisy shop operations.**

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10. **Keep visitors away.** All visitors should be kept a safe distance from the work area.
11. **Keep alert.** Do not operate tool if ill or drowsy from medication or fatigue. Avoid horseplay around tool and keep bystanders a safe distance from tool and pipe being grooved.
12. **Do not operate tool at speeds exceeding those specified in this manual.**
13. **Wear proper apparel.** Never wear loose clothing (unbuttoned jackets or loose sleeve cuffs) loose gloves or jewelry that can get caught in moving parts
14. **Do not force tool.** It will do the job better and safer at the rate for which it was designed.
15. **Support work.** Support long pipe with a pipe stand secured to the floor or ground.
16. **Do not misuse tool.** Perform only the functions for which the tool is designed. Do not overload the tool.
17. **Keep hands away from moving parts.** The cutting tool “rotates” around the pipe when the power drive is switched on. The pipe cut off head contacts the actuator bar as it passes by. Keep hands away from the actuator while the tool is in operation.

CAUTION

This tool should only be used to cut off and groove pipe designated in the Tool Rating and Tool Bit Selection Chart. Use of the tool for other purposes or exceeding the pipe thickness maximums will overload the tool, shorten tool life and may cause tool damage.

TOOL MAINTENANCE

1. **Unplug power cord prior to servicing.** Repair should be attempted only by authorized personnel. Always unplug power drive before servicing or making any adjustment.
2. **Maintain tool in top condition.** Keep tool clean for best and safest performance. Follow lubricating instructions.

POWER REQUIREMENTS

DANGER



. To reduce the risk of electric shock, check the electrical source for proper grounding and follow the instructions below.

. Before performing any repair or maintenance, disconnect the tool from the electrical source.

Failure to do so could result in death or serious personal injury.

Power must be supplied through a safety foot switch to assure safe operation. Be sure the power drive is properly grounded in accordance with Article 250 of the National Electrical Code. If an extension cord is to be used, see Extension Cord Requirements on this page for cord size recommendations.

EXTENSION CORD REQUIREMENTS

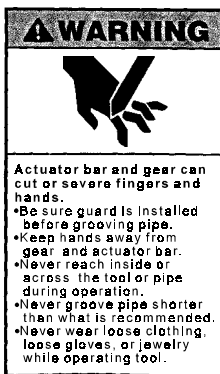
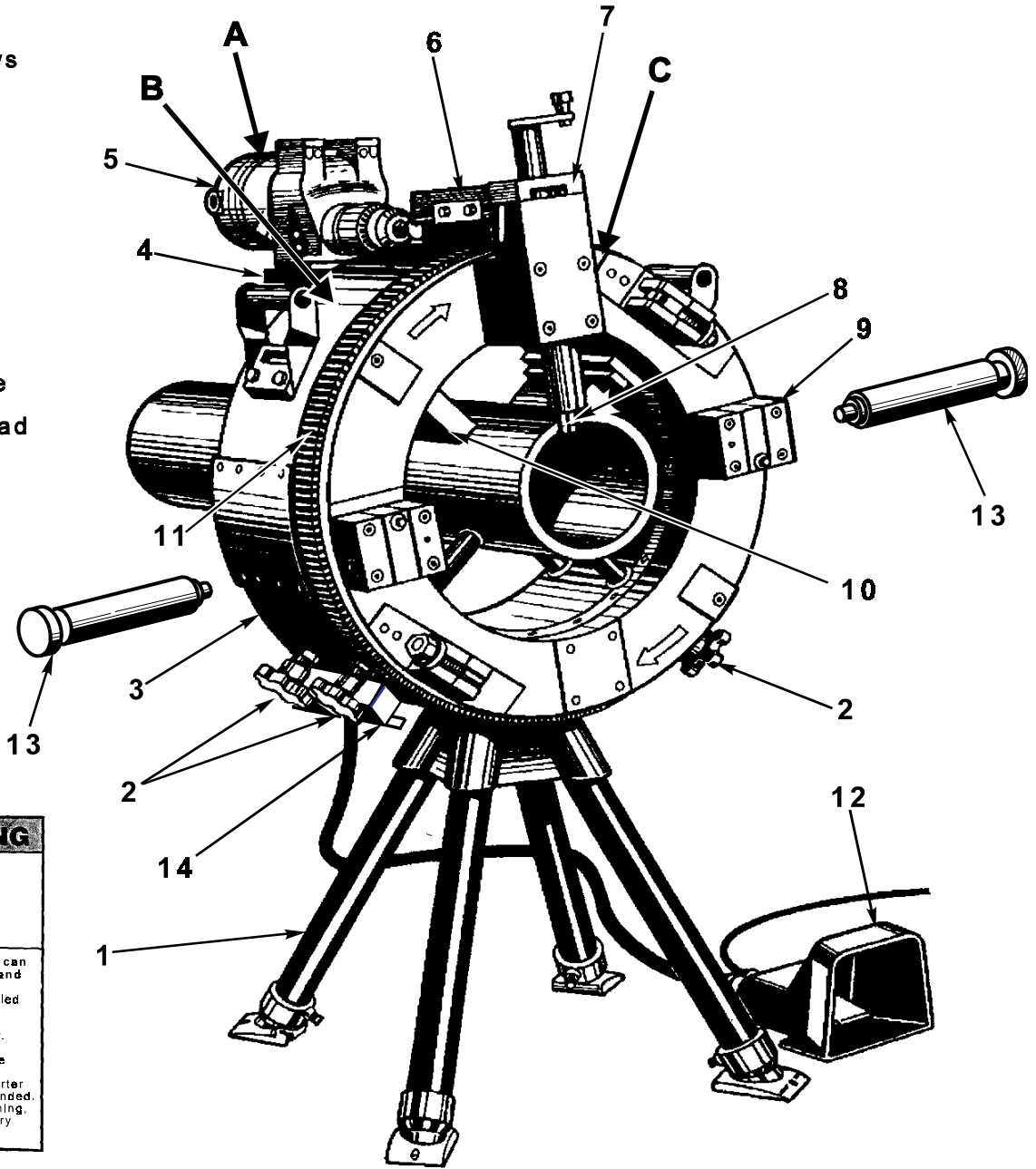
When pre-wired outlets are not available and an extension cord must be used, it is important to use the proper cord size (e.g. . conductor size American Wire gauge). Cord size selection is based upon tool rating (amps) and cord length (feet). Use of a cord size (gauge) thinner than required will cause a significant voltage drop at the power drive while the tool is operating. The voltage drop may cause damage to the power drive and can result in failure of the tool to operate properly. Use of a heavier than necessary cord size (gauge) is acceptable.

Listed in the chart below are recommended cord size (gauge) for cord lengths up to and including 100 feet. Use of extension cords beyond 100 feet in length should be avoided.

TOOL MODEL	POWER DRIVE RATING VOLT/AMPS	CORD LENGTHS		
		25'	50'	100'
VG412	115/15	12 Ga.	12 Ga.	10 Ga.

TOOL NOMENCLATURE

1. Tool Legs
2. Clamp Screws
3. Hinged Main Frame
4. Motor Mount
5. Motor
6. Pinion and Hex Drive
7. Cut Off Head Assembly
8. Cut Off Blade
9. Grooving Head Block
10. Riser Block
11. Gear Plate
12. Foot Switch
13. Tool Bit Holders
14. Index Block Assembly



B



C



A

Figure 1

RECEIVING TOOL

VG 412 tools are packed individually in sturdy containers, designed for use in reshipping tools upon completion of the rental contract, when applicable.

NOTE: Be sure to save original shipping container for return shipment of rental tools.

Upon receipt of tool, make sure all necessary parts are included. If any parts are missing, notify your Victaulic distributor or Victaulic representative.

CONTAINER CONTENTS

(See page 8 for list of contents)



Figure 2



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CONTAINER CONTENTS

1. Hinged main frame with gear plate halves installed. (Note: weight = 138 pounds (63Kg).
2. Motor, footswitch, power cord with plug assembly.
3. Motor mount and mounting hardware.
4. Cutoff blades.
5. Grooving bits for 4" - 6" D.I. and 8" - 12" D.I., one set each.
6. Tool stand with four legs.
7. Riser blocks for 6" - 10" D.I. (12" mounted on frame)
8. One cutoff blade assembly.
9. Two grooving blade assembly.
10. One 4" cutoff/groove component kit.
11. One set D.I. rigid groove spacer blocks.
12. Two tool operating and maintenance manuals.

TOOL RATING

The standard VG 412 tool is supplied with the necessary components to cut off and cut groove 4" - 12" D.I. pipe with rigid grooves for use with Victaulic grooved piping products for AWWA ductile piping. For grooving to other specifications and other materials, see tool bit selection chart on page 38. Component parts for other materials must be purchased separately.

TOOL SET-UP

WARNING

Do not connect the power until instructed otherwise. Accidental start up of tool may result in serious injury.

WARNING

The power drive must be operated with a safety foot switch, as the operator will require it to operate the tool safely. If your power drive does not have a foot switch, contact Victaulic.

This section has four parts: (1) general set up instructions; (2) set up instructions for short pipes (less than 12 inches); (3) set up instructions for long pipes; and (4) set up instructions for tool installed **around** the pipe, for example, in the field with a pipe already in position.

GENERAL

The VG 412 is intended for shop or field use. It will cut and groove 4" through 12" (100 - 300mm) pipe from full lengths down to approximately 12" in length. Pipe must be adequately supported as the unit is not intended to carry the weight at the pipe. (Support both ends of pipe if necessary.) Short lengths of less than 36" can be accomplished with the use of the pipe stand. The tool and pipe supports must be placed on level ground. See Operator Instructions, Tool Set Up #2, Dangerous Environments.

GENERAL PROCEDURES

Remove all components from the container, and be sure that all necessary items are included. See list under Receiving Tool.

WARNING

During tool set-up, one person cannot safely handle the tool head assembly because it weighs 140 lbs. Two people are needed to safely handle the assembly. If a hoist is available, use it to lift the tool head assembly into position.

Failure to follow this instruction may result in serious injury.

WARNING



Gear plate teeth contain sharp edges and could cut fingers during set-up. Wear gloves.

Failure to follow this instruction may result in serious injury.

1. Select location for tool and pipe stand (s). Choose a location that has:
 - a. The required power. Consult the power requirements on page 4.
 - b. The space necessary to adequately handle the pipe to be grooved.
 - c. A level and even surface for tool, pipe stand (s), and footing.

SET UP TO CUT OFF SHORT PIPES:

⚠ WARNING

Unit should not be plugged in while setup is being completed.
Failure to do so will result in injury.

The procedures to set up and cut off a short pipe are:

1. Insert legs (4) into sockets on bottom of tool support table and tighten bolts finger tight.



Figure 3

2. Set tool upright. Adjust legs to achieve a level tool and assure that all four (4) of the legs are resting on the floor to prevent the tool from rocking, and tighten with a wrench.



Figure 4

3. Attach the motor mount to the main frame using four (4) wing handle clamp screws.



Figure 5

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4. Attach the motor to the top of the motor mount, do not tighten. Rotate chuck to align with hex drive of the pinion and move motor forward to engage. Tighten drive motor chuck with chuck key. Tighten wing handle clamp screws to secure motor in place.



Figure 6

5. Select two (2) riser blocks for the size of pipe to be cut and grooved. Attach the riser blocks to the base plate inside the main frame. **NOTE:** The permanently mounted base plates serve as the riser blocks for the 12" size.

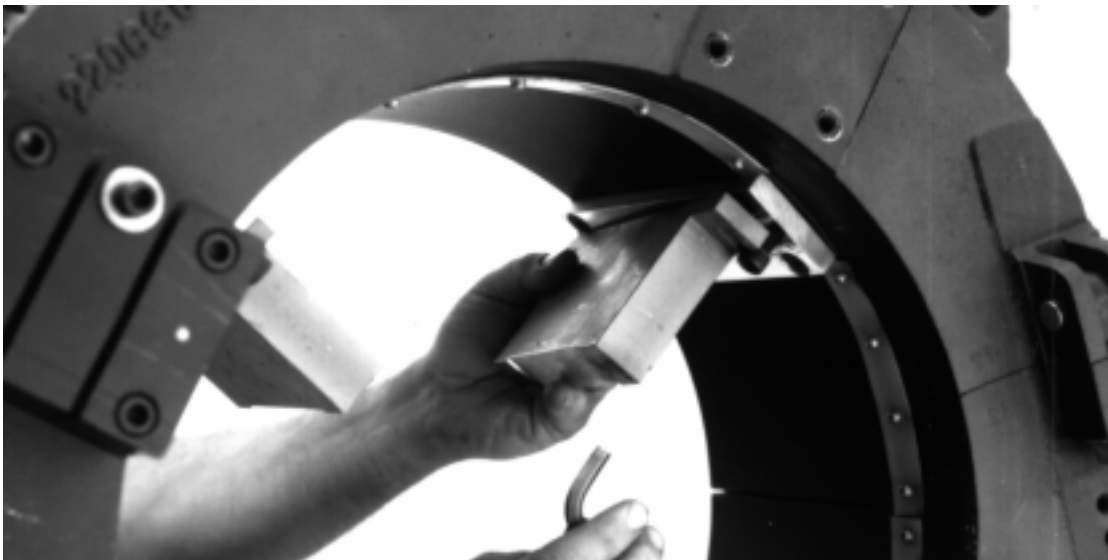


Figure 7

6. Adjust the clamp screws, on the lower half of the frame, so that there is an opening at least 1/2" larger than the size of pipe to be grooved.
7. Insert pipe between riser blocks and clamp screws.



Figure 8

8. Tighten clamp screws on the pipe evenly. Pipe must contact both riser blocks squarely, and with sufficient force to resist rotation of the pipe during cut off and grooving. **NOTE:** Check the tightness of the clamp screws throughout the cutting and grooving operations, and retighten if necessary.

⚠ CAUTION

Failure to maintain tightened clamp screws may result in pipe rotating and damage to the tool.

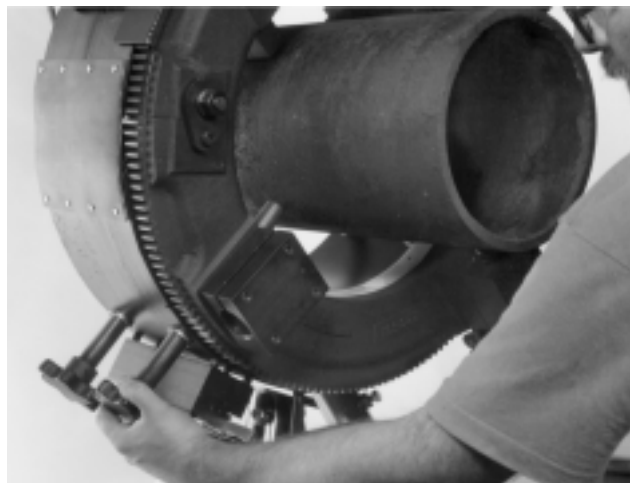


Figure 9

NOTICE

Follow steps 9, 10, and 11 only if gear plate has been removed. If gear plate has NOT been removed go to step 12

9. Engage one-half (1/2) of gear plate over the track rollers on the bottom half of the frame and rotate upward until the gear half is centered on the pinion gear.

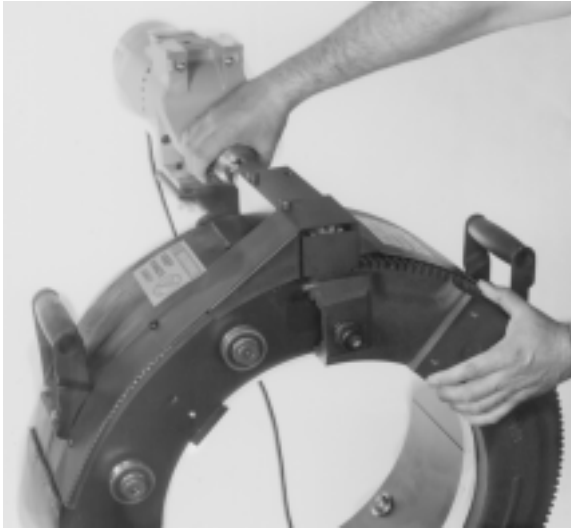


Figure 10

10. Engage the other half of the gear plate over the track rollers, and bring the two halves together.
11. Engage and secure the swing bolts or swing latch by tightening the hex nuts securely.



Figure 11

12. Select the spacer block for the size of pipe to be grooved.
13. Attach cutoff head assembly on top of spacer block with four (4) allen head screws. **NOTE:** Retract cutoff blade to clear pipe if necessary by pressing detent lever and turning crank handle clockwise. Tighten screws securely. **DO NOT** have grooving blade assemblies on gear plate while cutting.



Figure 12

14. Retract motor. Rotate gear plate manually completely around the pipe to find the “high spot”. Press the dentent lever and turn crank counter clockwise until there is approximately 1/32” to 1/16” clearance between pipe and edge of cutoff blade at the “high spot”.
15. Rotate the gear plate until the blade assembly is at the bottom near the actuator bar.

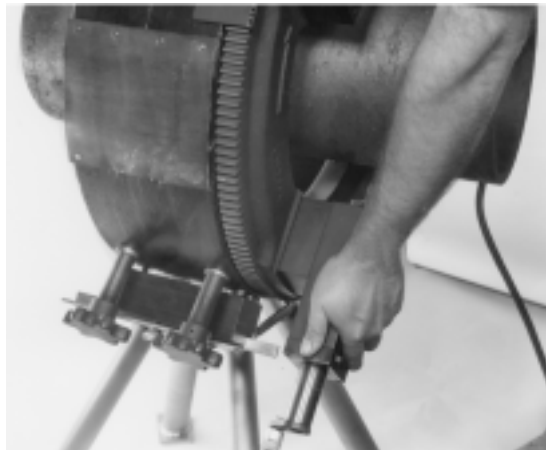


Figure 13

16. The actuator bar should be set to engage the star wheel with approximately 1/32" clearance at the bottom of the star wheel. Fine adjustment can be made with the two wing screws found in the slots of the actuator mechanism base.



Figure 14

17. Prepare to support the piece of pipe that is being cut off.

⚠ WARNING	
Support pipe end that is cut off.	
Failure to follow instructions may result in serious injury.	

18. Plug in the power drive and activate tool by depressing foot switch. After two or three revolutions the cutoff blade will contact pipe intermittently, and after a few more revolutions will be cutting completely around the O.D. of the pipe. Because the cut started intermittently, it will end intermittently, meaning it will be through the pipe wall at some places before others
19. After pipe is completely cut off, remove foot from switch and allow tool to stop rotating
20. Unplug power cord to power drive until further needed.
21. Loosen wing screws and retract actuator bar (can be tapped with a soft mallet)

To cutoff another pipe return to step number 7.

SET UP FOR TOOL INSTALLED AROUND PIPE

1. Remove grooving head and cut off head from front of gear plate.



Figure 15

2. Separate the two halves of the gear plate by loosening the hex nuts at the joint.
3. Release the gear plate swing plates, and separate the gear halves and remove the lower half from the main frame. Then roll the other gear half out of engagement with the pinion and remove it from the main frame.

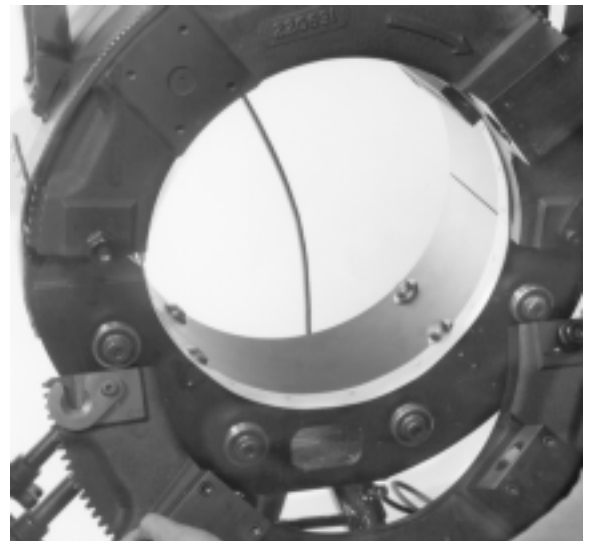


Figure 16

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4. Select the proper pair of riser blocks from those provided with the tool, and attach to the upper frame with screws provided. The permanently mounted base plates are for the 12" size. Each riser block has the pipe size marked on it.

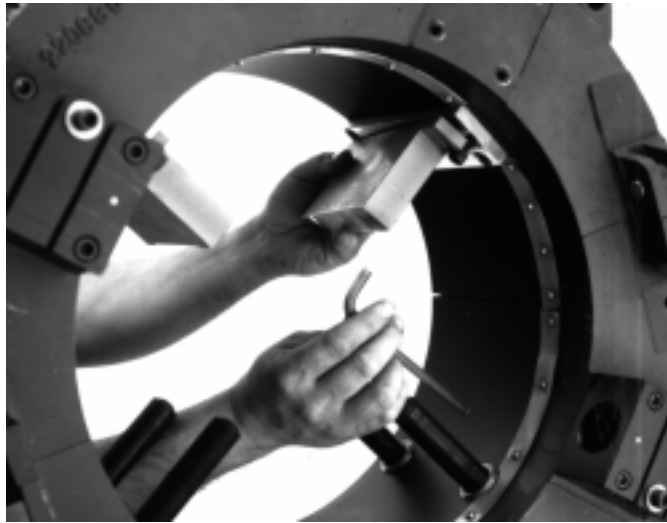


Figure 17

5. Adjust the clamp screws on the lower half of the frame to at least 1/2" larger than pipe size being cut and grooved.
6. Slide the frame over the pipe end near to the point where the pipe is to be cut and grooved. Where this is not possible, the frame may be hinged open by opening the swing bolts. Then the frame may be hinged open and assembled around the pipe. Close the swing bolts and retighten.

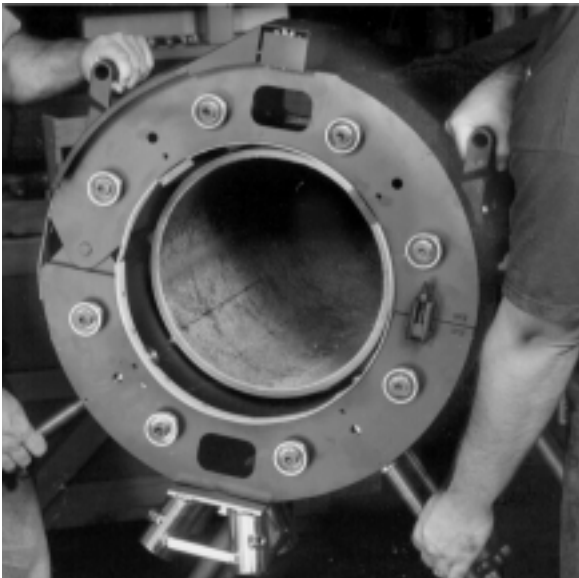


Figure 18

7. Tighten clamp screws on the pipe evenly and with sufficient force to resist rotation of the pipe during cut off and grooving. **NOTE:** Check the tightness of the clamp screws throughout the cutting and grooving operation, and retighten if necessary

⚠ CAUTION

Failure to maintain tightened clamp screws may result in pipe rotating and damage to the tool.

8. Attach the motor mounting bracket to the rear or the frame.



Figure 19

9. Attach the motor to the bracket, with the wing screws, but do not tighten. Align the hex in the drive socket with the hex on the drive shaft by turning the chuck by hand and slide the socket over the drive hex. Tighten the chuck and tighten the mounting wing screws securely.



Figure 20

10. Engage one-half of the gear plate over the track rollers on the lower half of the frame and roll to engagement with the pinion (pinion gear on the lower half of the frame should be in middle of gear plate half). Hold the first half of the gear plate in this position while engaging the other half of the gear plate over the track rollers and bring the two halves together. Engage and secure the swing bolts.
11. Select the spacer block that corresponds with size pipe to be cut and grooved.
12. Retract cutoff blade for at least 1/2" nominal clearance when attached to the gear plate.
13. Attach the cutoff blade assembly on top of the spacer block, with the screws provided, to the face of the gear plate securely.



Figure 21

14. Rotate gear plate manually completely around the pipe to find the "high spot". Press the detent lever and turn crank counter clockwise until there is approximately 1/32" to 1/16" clearance between pipe and edge of cutoff blade at the "high spot"
15. Rotate the gear plate until the blade assembly is at the bottom near the actuator bar.



Figure 22

16. Fine adjustment can be made with the two wing head screws found in the slots of the actuator mechanism base. The actuator bar should be set to engage the star wheel with approximately 1/32" of clearance at the bottom of the star wheel.



Figure 23

17. Tighten clamp screws on the pipe evenly and with sufficient force to resist rotation of the pipe during cut off and grooving. **NOTE:** Check the tightness of the clamp screws throughout the cutting and grooving operation, and retighten if necessary.

⚠ CAUTION

Failure to maintain tightened clamp screws may result in pipe rotating and damage to the tool.

18. Plug the power cord into a grounded outlet of the appropriate voltage.

⚠ DANGER



- . To reduce the risk of electric shock, check the electrical source for proper grounding and voltage.
- . Failure to do so could result in death or serious personal injury.

19. Operate the tool by stepping on the footswitch. Observe the operation. If everything is functioning correctly, the cutoff tool bit will begin to cut the pipe after a few revolutions.

20. Be aware that while cutting off the end of a pipe, that when the tool bit breaks through the material all the way around, the pipe end will fall down. Also be aware that if you are cutting a long pipe, that both ends need to be supported in a manner that will prevent the pipe and or the tool from tipping or falling in either direction.

⚠ WARNING
Support pipe end that is cut off.
Failure to follow Instructions may result in serious Injury.

21. When the cutoff is complete, unplug the power cord to prevent accidental engagement of motor.

22. Loosen the wing screws and retract the actuator bar completely.

NOTICE
Do not retract cut off blade.

23. With the tool bits installed, place the tool bit holders into the grooving head block and tighten the clamp screws, so that the tool bits clear the pipe by 1/16" at the high spot. Rotate the gear plate by hand to assure clearance all the way around. Do not overtighten the clamp screws or the grooving tools will not feed properly.

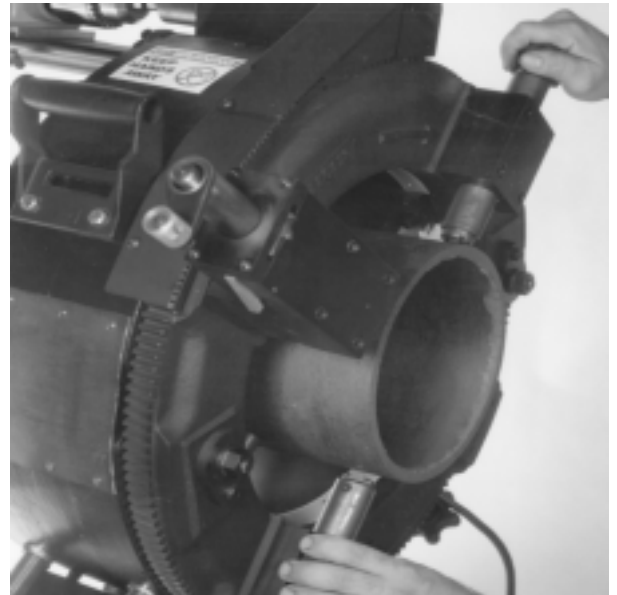
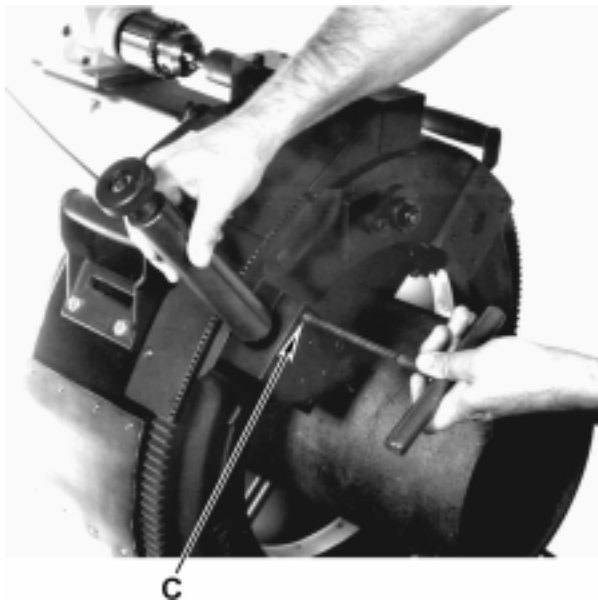


Figure 24

24. Turn the hand knob until tool bits contact the pipe at the highest point and add 1.5 to 2 turns on the knob for preload.
25. Plug in the power cord and proceed with the groove. The blade will feed automatically, and will stop grooving when it runs out of preload. Stop the tool and add additional preload to complete the groove. The groove is finished when the depth stops on groove blade holder contact with the pipe and makes a mark 360 degrees around the pipe.

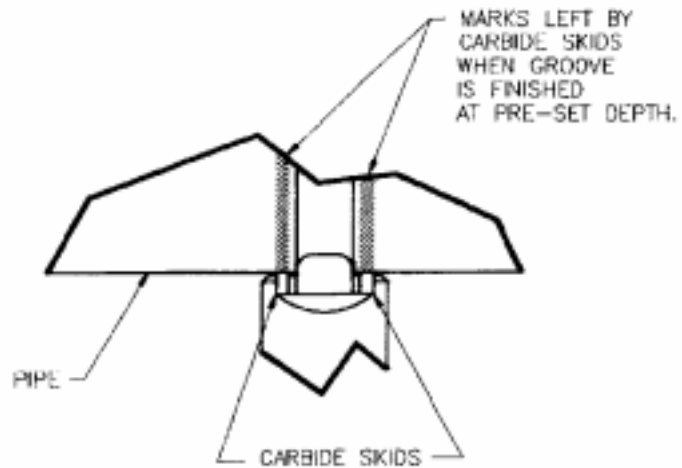


Figure 25

26. Stop the tool, disconnect the power cord. Retract the grooving tool bits, and check the groove diameter before removing the tool.

CUTTING AND GROOVING

This section has instructions for cutting and grooving various types of materials. This section has three parts: (1) cutting and grooving 6" 8", 10", and 12": gray and ductile pipe of AWWA dimensions (2) cutting and grooving gray and ductile 4" pipe of AWWA dimensions: (3) cutting and grooving steel pipe.

⚠ WARNING	
	Gear plate teeth could cut fingers during set-up. Wear gloves.
	Failure to follow this Instruction may result in serious injury.

CUTTING AND GROOVING 6" - 12" GRAY & DUCTILE PIPE.

Cutting

1. Use carbide tipped blades for cutting off the pipe to length. Use sharp blades, as use of dull blades will cut slowly, if at all, and are much more likely to break.
2. Adjust the blade exposure as shown in Figure 26. (Wall thickness of pipe to be cut plus 1/4")



Figure 26

3. Depress detent lever and turn crank clockwise to retract blade to clear pipe before attaching to face of gear plate.



Figure 27

4. Select the spacer block which corresponds to the size pipe and style of groove, rigid or flexible, and attach to face of gear plate behind cut off head with socket head screws.

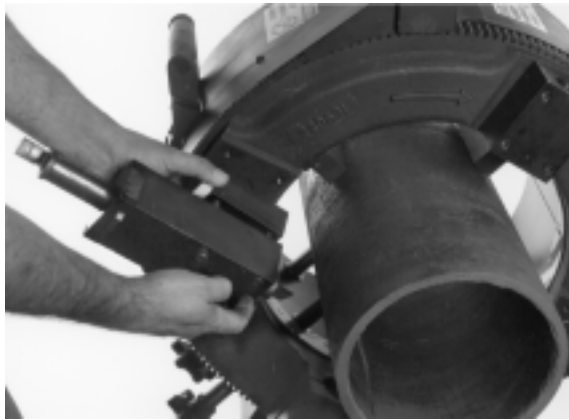


Figure 28

5. Proceed with cut off.
6. After completing the cut off, loosen and move the actuator bar back completely out of the way. Do not retract cut off blade 6" - 12".

Grooving

7. For grooving these diameters, the tool bits are used in the following pair combination:

6" = 220680 and 220568

8" - 12" = 220569 and 220679

8. Remove blade holder from blade block. Turn hand knob to expose set screws "D".

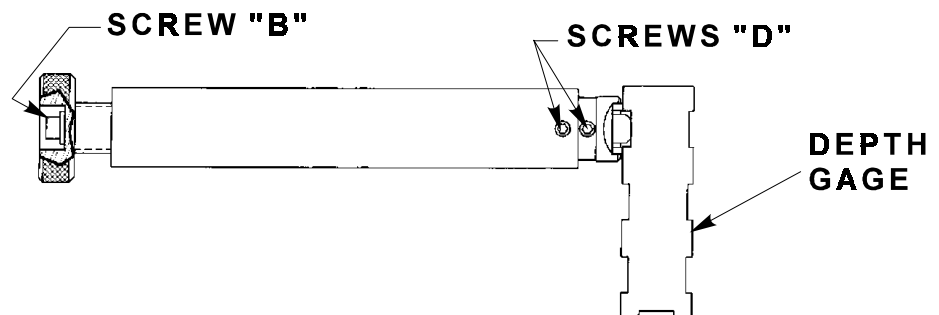


Figure 29

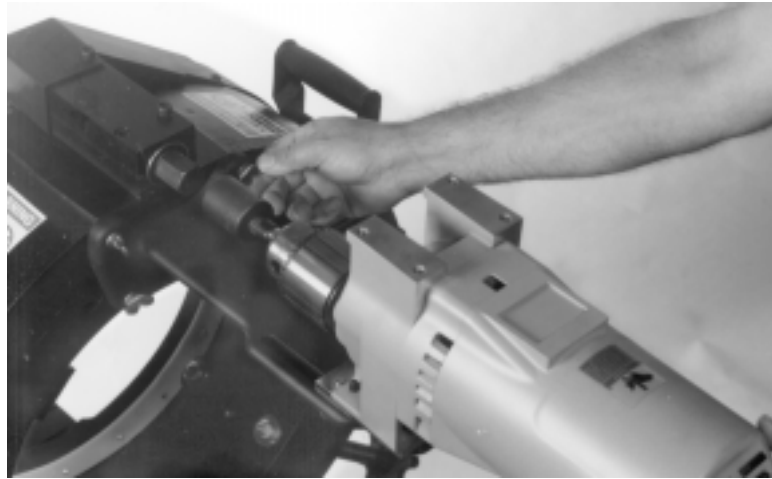
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9. Loosen both set screws and install proper groove blade.
10. Adjust the tool bits as shown in Figure 29. Turn hand knob clockwise to expose both set screws "D". Loosen both set screws. Turn adjusting screw "B" to adjust groove depth. Use depth gage to check depth, the lock blade set screws "D". Then retighten the set screws.
11. Turn hand knob counter-clockwise to retract blade until both set screws are covered.
12. Loosen clamp screws, "C" Figure 24, and slide blade holder into the blade block until the blade just clears the high spot on the pipe. Tighten screws "C" and rotate the gear plate by hand to be sure blade clears the pipe and the actuator bar clears the handknob.

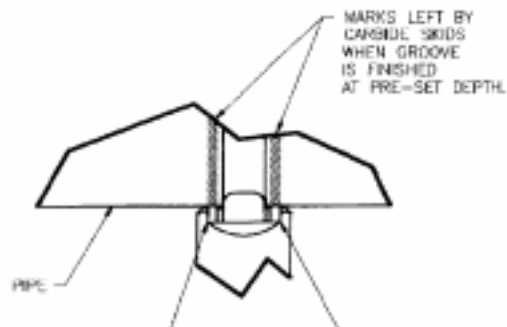


Figure 30

13. Turn the hand knob until tool bits contact the pipe at the highest point and add 1.5 to 2 turns on the knob for preload.
14. Engage the drive shown in Figure 31 and turn on power and commence grooving.

**Figure 31**

15. As the grooving continues, it will be necessary to stop the gear plate and add more preload at the rate of 1.5 to 2 turns of the hand knob clockwise. When the groove is complete, the depth stops will contact the pipe 360 degrees around the outside, leaving a mark completely around the O.D. of the pipe.

**Figure 32****⚠ WARNING**

Always stop gear plate before adjusting additional preload.

Failure to follow instructions may result in serious injury.

16. Stop the gear plate, unplug power drive, release the preload on the blades, and check groove diameter.
If groove diameter is not correct, repeat steps 8 to 16.

WARNING

.Release the preload on the grooving blades.
.Failure to do so may result in blade holders ejecting from the
blade holder blocks.

NOTICE

.Cut dry - Do not use oil
.Be sure blade is sharp
.Be sure actuator bar is retracted when grooving and beveling

CUTTING AND GROOVING GRAY & DUCTILE 4" PIPE

NOTE: When cutting and grooving 4" pipe, additional components must be added to the main frame as well as the gear plate. Also, one grooving head rather than two are used for 4" pipe.

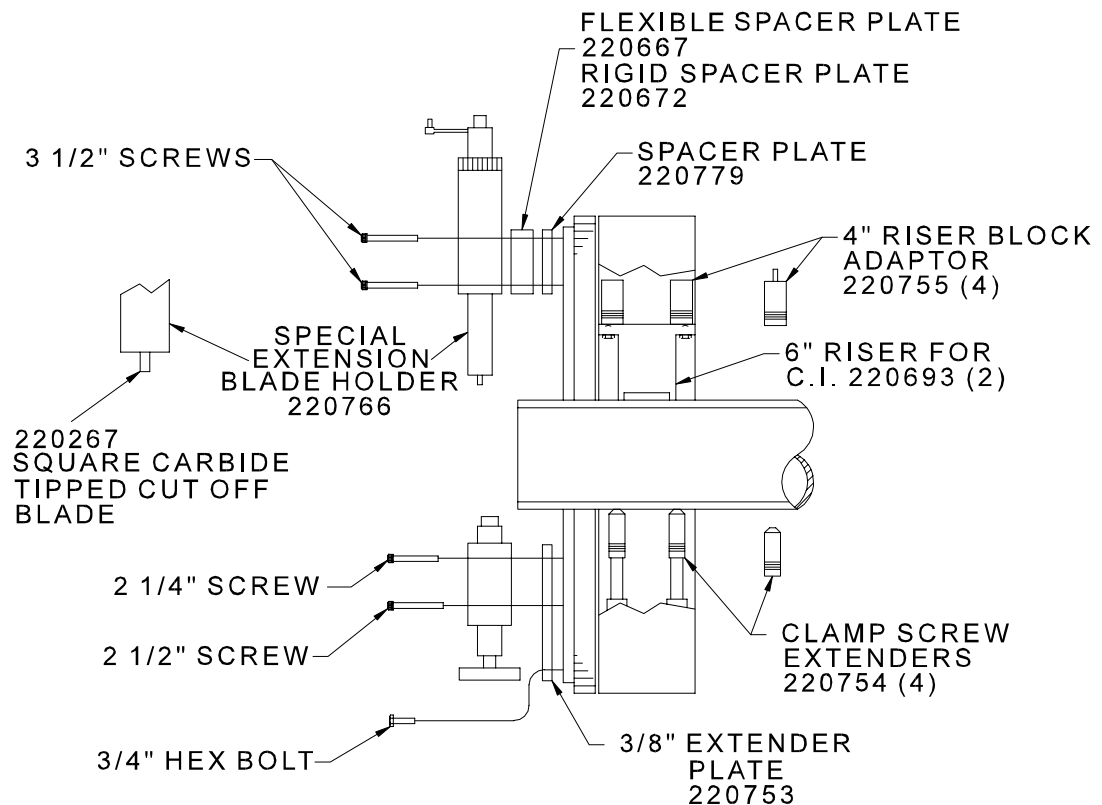


Figure 33

1. The 6" block, rigid or flexible, is used with spacer Plate No. 220779. Both of these spacers are installed behind the cutoff head assembly.

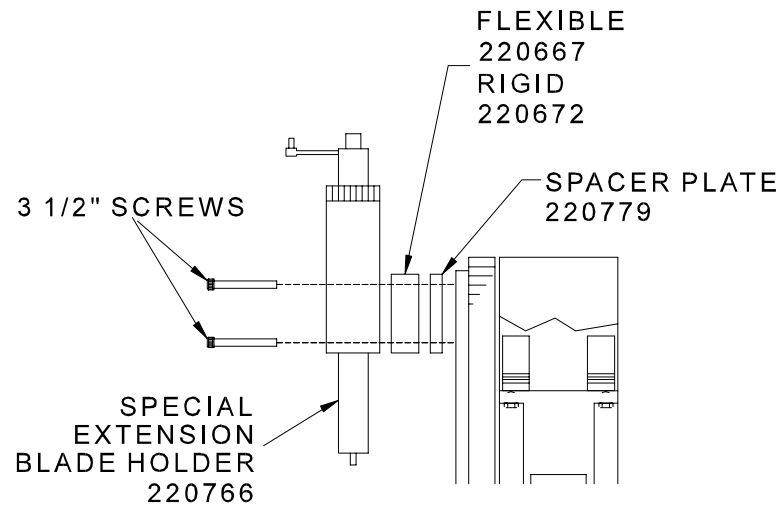


Figure 34

2. Remove the blade holder assembly from the cutoff assembly by depressing the detent lever and turning crank until holder is completely un-threaded. Replace standard blade holder with extended blade holder by turning blade holder by hand until the groove in the holder aligns with the guide pin. Then depress detent lever and turn crank until holder is completely threaded into assembly.

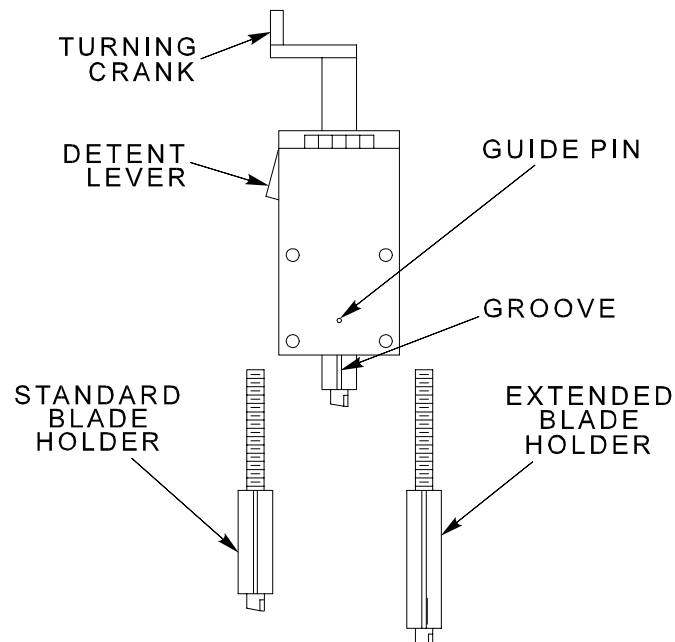


Figure 35

NOTICE

When grooving 6" and larger pipe, grooving blocks are located 180° apart.

3. Install 220680 3/8" groove blades into one holder.
4. Attach extender plate No. 220753 to gear plate with two hex head screws.
5. Attach grooving blade holder to extender plate and gear plate using four socket head screws.
6. Attach the clamp screw extenders to the end of the clamp screws.
7. The 6" riser blocks are installed on top of the riser adapters.

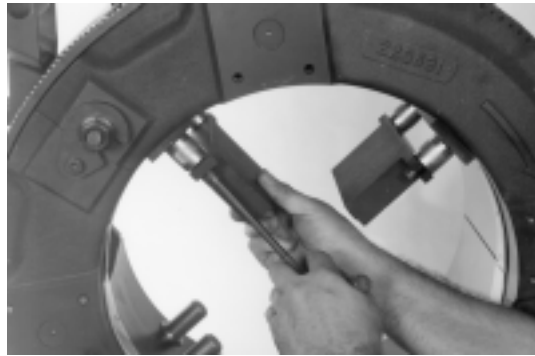


Figure 36

8. Proceed with cutting and grooving.

CUTTING AND GROOVING STEEL PIPE

NOTE: The VG412 tool is only recommended for use on steel lined pipe.

1. Instructions are similar to cutting Cast Iron and Ductile Iron Pipe except: Two cutter heads operating simultaneously and using the specified two tool steel cutoff blades, are required for cutting carbon steel pipe. Each of these opposing angle type cutoff blades are intended to cut a little more than half the full cut width in order to produce two “half “ chips. Figure 38
2. Be sure blade set screws are tight so blades don't slip while under pressure.



Figure 37

3. With the tool securely clamped on the pipe, rotate the gear plate by hand manually advancing one cutoff blade until it is lightly touching the “high spot” on the pipe.
4. Now rotate the gear plate 1/2 turn and advance the other cutoff blade until it is lightly touching the same “high spot” on the pipe.
5. Proceed to cut under power applying a good grade of sulphurized or water soluble cutting oil on the cut. Apply with brush or spray bottle, do not flood. A finished cut on 12" sch 40 steel pipe should take 5 to 6 minutes. The cut should look like this:

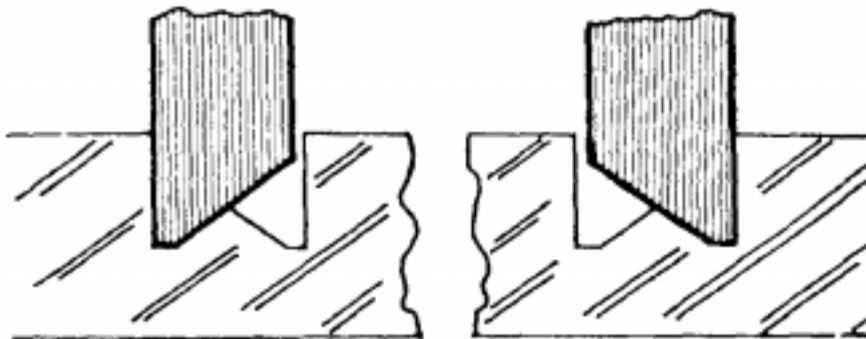


Figure 38

NOTES:

- *Be sure that both blades are sharp to insure good, clean cutting action. These blades are of high quality tool steel and are easily resharpened. **DO NOT CUT STEEL WITH CARBIDE TIPPED BLADES.**
- * Be sure that both star wheels are being turned by the actuator bar the same amount each time.
- * When cutting ordinary carbon steel pipe, the “chip” generated by the cutoff blades may occasionally accumulate in the cut and cause the blades to jam, stopping the machine. If this happens: (1) take foot off power switch; (2) unplug power cord from power source; (3) retract cutter blade one-half turn; (4) rotate gear plate one-quarter turn counter clock-wise; (5) cleanout chips from cut groove; and (6) restart machine and continue cutting. Be sure to retract cutting blade 1/2 turn before resuming cutting operation.

** WARNING**

Always stop tool and unplug power cord before cleaning out chips.

Accidental start up of tool may result in serious injury.

DISASSEMBLY, CLEANING & STORING

The tool should be disassembled and cleaned before moving it to another work site or putting it in storage. The following procedures apply to disassembly and cleaning.

⚠ CAUTION
Gear could rotate freely after motor is disengaged and blade crank arm could hit operator.
Stay away from gear plate when disengaging motor.

⚠ CAUTION
Lifting heavy parts during disassembly could strain back.
* Use two man lift * Use hoist if available

⚠ CAUTION
Sharp cutting and grooving tool blades could cut fingers during disassembly.
* Wear gloves when removing cutting and grooving tool blades.

1. Unplug motor from the power source.
2. Slide indexing bar back.
3. Remove spacers.
4. Remove motor. Two people are needed for this operation, as described below.
 - Make sure no one is near the gears, then slide the motor away from pinion block by loosening the wing handle clamp screws beneath motor. CAUTION. When motor is disengaged, the gears may rotate. No one should be near the gears when the motor is being disengaged
 - Retighten wing handle clamp screws below motor.
 - The motor mount is fastened to the gear plate by four wing handle clamp screws. While one person unfastens these screws, a second person should prepare to support the weight of the arm and motor. It takes two hands to hold the motor and motor mount. The person loosening the screws only has one free hand. Therefore, a second person is needed.

- Put the motor and motor mount assembly into a box or other container for transport. Make sure screws are kept with the assembly.
5. Clean gears with a cloth or brush. **CAUTION.** Sharp cutting and grooving tool blades could cut fingers. Wear gloves.
 6. Remove tool from pipe. Lift it with a hoist, if available. If a hoist is not available, two people should lift it together. The tool is too heavy and bulky for one person alone. **CAUTION.** This operation should not be attempted by one person alone.

MAINTENANCE

GENERAL

This section of the manual provides information about keeping tools in top operating condition.

Replacement parts, applicable to these tools, should be ordered from Victaulic to assure proper operation of the tool. All parts are FOB Easton, Pennsylvania, at the price in effect at the time of the order.

⚠ DANGER	
	Before performing any repair or maintenance, disconnect the tool from the electrical source to prevent accidental start up of tool. Failure to do so could result in death or serious personal injury.

NOTICE
Remember that preventive maintenance during operation will pay for itself in repair and operating savings.

8-HOUR CARE

After every 8 hours of operation, lubricate the machine.

1. The eight radial bearings (275727) require periodic attention as follows:
 - Check tightness of nut (275789) on shoulder screw (275726). Retighten if necessary.
 - Bearings should rotate freely. If bearings do not rotate freely, replace them. If bearings become excessively loose, replace them.
 - The two radial bearings (275729) used in the pinion block (220621) are pre-lubricated, sealed, and shielded. These bearings are expected to be maintenance free, provided that they are not damaged in use.

BLADE SHARPENING

Dull blades are the most common cause of cutting difficulties. Dull blades can cause blade failure and damage the blade holders, bearings, and gear teeth. Suggested resharpening schedules are provided in the tables below.

The number of cuts possible before sharpening will vary with pipe material, condition, diameter, wall thickness, exterior coating, and interior lining.

DO NOT attempt to cut, bevel, or groove with a dull blade.

DO resharpen blades that are in questionable condition.

⚠ CAUTION	
Sharp blade edges could cut fingers during sharpening.	
* Wear gloves	

CUTOFF BLADES
Suggested Resharpening Schedule

Pipe Size	Cast Iron	Ductile	Steel
12	8	6	5
10	10	8	7
8	13	11	10
6	17	15	14
4	22	20	20

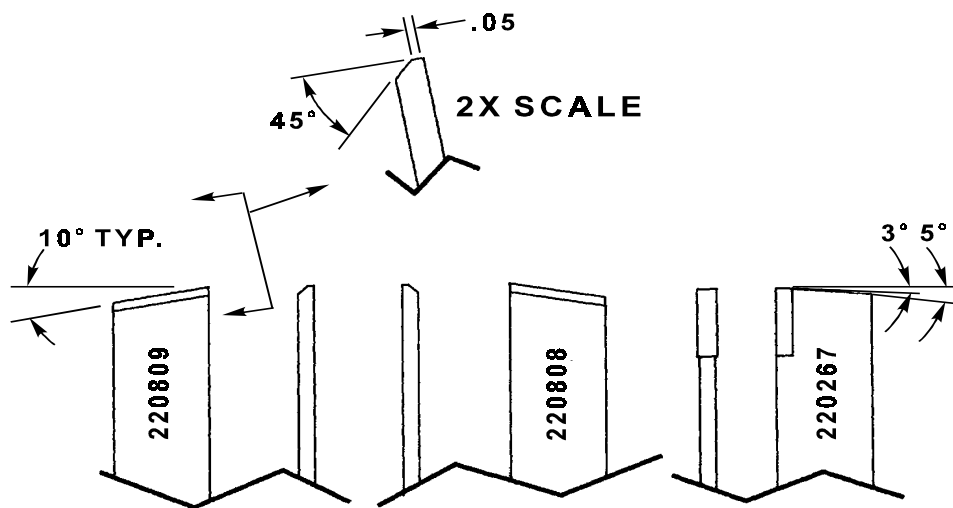


Figure 39

GROOVING BLADES

Suggested Reshaping Schedule

Pipe Size	Cast Iron	Ductile	Steel
12	22	18	10
10	28	24	14
8	40	34	20
6	55	15	28
4	70	60	40

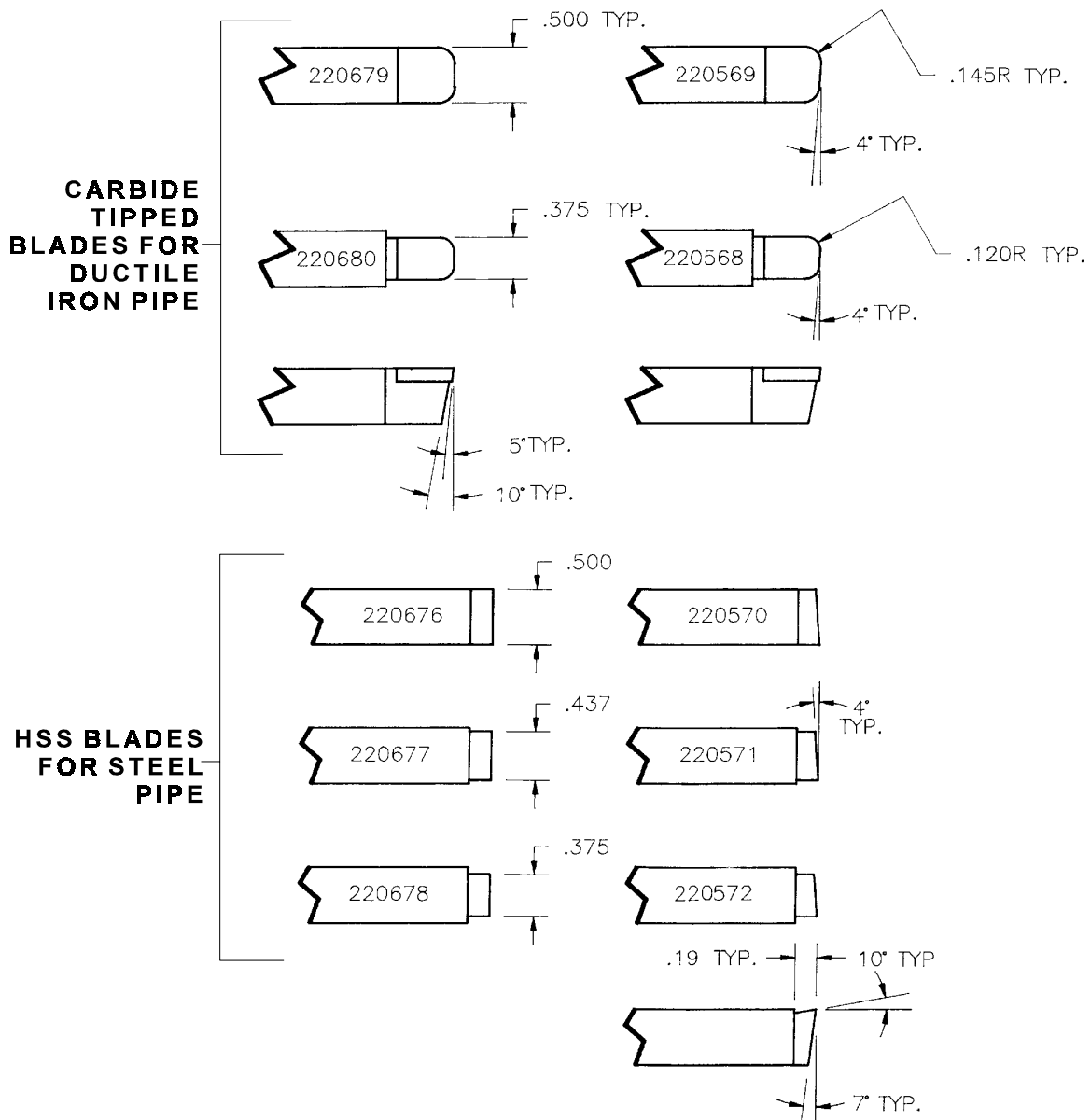


Figure 40

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Motor stalls or machine jams.	Dull blades. Blades over tightened.	Sharpen or install new blades. Reset blades.
Chatter when grooving.	Hard spots in pipe. Not enough preload on blades. Loose or worn bearings.	Add 1/2 turn to grooving blade preload. Continue grooving. Chatter will clean up at end of groove. Check & service bearings.
Blade breakage.	Dull blades. Improper setting or adjustment. Loose or worn bearings.	Sharpen or install new blades. Review instructions & reset. Check and service bearings.
Wrong groove dimensions.	Incorrect blades or spacer blocks. Improper blade adjustment.	Review instructions and reset blades. Check & install proper spacer blocks.

GROOVE SPECIFICATIONS

Standard Cut Groove Specifications-Steel and Other IPS PIPE †

1	2				3	4	5	6	7
Nom. Size Inches mm	Dimensions-Inches/millimeters								
	Pipe Outside Diameter O.D.			Gasket Seat A	Groove Width B	Groove Diameter C		Groove Depth D (Ref.)	Min. Allow. Wall Thick T
				+ 0.03 ±0.79	+ 0.03 ±0.79				
	Basic	Tolerance				Basic	Tol. +0.000		
4 100	4.500 141.3	+0.045 +1.14	-0.031 -0.79	0.625 15.88	0.375 9.53	4.334 110.08	-0.020 -0.51	0.083 2.11	0.203 5.16
4 1/2 120	5.000 127.0	+0.050 +1.27	-0.031 -0.79	0.625 15.88	0.375 9.53	4.834 122.78	-0.020 -0.51	0.083 2.11	0.203 5.16
5 1/2 ‡	5.500 139.7	+0.056 +1.42	-0.031 -0.79	0.625 15.88	0.375 9.53	5.334 135.48	-0.020 -0.51	0.083 2.11	0.203 5.16
5 125	5.563 141.3	+0.056 +1.42	-0.031 -0.79	0.625 15.88	0.375 9.53	5.395 137.03	-0.020 -0.51	0.084 2.13	0.203 5.16
6 ‡	6.000 152.4	+0.056 +1.42	-0.031 -0.79	0.625 15.88	0.375 9.53	5.830 148.08	-0.022 -0.56	0.085 2.16	0.219 5.56
6 1/2 ‡	6.500 165.1	+0.063 +1.60	-0.031 -0.79	0.625 15.88	0.375 9.53	6.330 160.78	-0.022 -0.56	0.085 2.16	0.219 5.56
6 150	6.625 168.3	+0.063 +1.60	-0.031 -0.79	0.625 15.88	0.375 9.53	6.455 163.96	-0.022 -0.56	0.085 2.16	0.219 5.56
8 ‡	8.000 203.2	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.438 11.13	7.816 198.53	-0.022 -0.56	0.092 2.34	0.238 6.05
8 200	8.625 219.1	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.438 11.13	8.441 214.40	-0.025 -0.64	0.092 2.34	0.238 6.05
10 ‡	10.000 254.0	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	9.812 249.23	-0.025 -0.64	0.094 2.39	0.250 6.35
10 250	10.750 273.0	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	10.562 268.28	-0.027 -0.69	0.094 2.39	0.250 6.35
12 ‡	12.000 304.8	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	11.781 299.24	-0.027 -0.69	0.109 2.77	0.279 7.09
12 300	12.750 323.9	+0.063 +1.60	-0.031 -0.79	0.750 19.05	0.500 12.70	12.531 318.29	-0.030 -0.76	0.109 2.77	0.279 7.09

STANDARD CUT GROOVE SPECIFICATIONS NOTES

*9/16" (14mm) width groove is required in sizes 22-24" (550-600 mm) in order to obtain the maximum allowable pipe end movement listed in Performance Data Charts. 1/2" (12 mm) width groove will give 1/2 the maximum allowance shown for 22-24" (550-600 mm). For double groove tool bit information, contact Victaulic.

† Coatings applied to the interior surfaces, including bolt pad mating surfaces, of our grooved and bolted plain end couplings should not exceed 0.010" (0.25 mm). Also, the coating thickness applied to the gasket seating surface and within the groove on the pipe exterior should not exceed 0.010" (0.25 mm).

COLUMN 1: **Nominal IPS Pipe size.**

COLUMN 2: **IPS outside diameter.** The outside diameter of cut grooved pipe shall not vary more than the tolerance listed. For IPS pipe the maximum allowable tolerance from square cut ends to 0.030" for 3/4-31/2"; 0.045" for 4-6"; and 0.060" for sizes 8" O.D. and above measured from true square line.

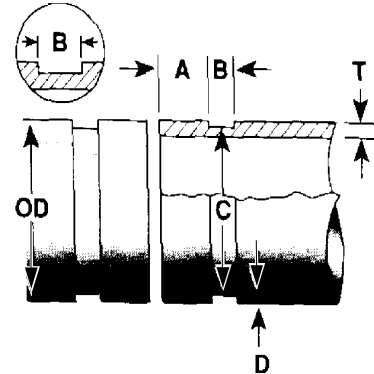
COLUMN 3: **Gasket seat.** The pipe surface shall be free from indentations, roll marks, and projections from the end of the pipe to the groove, to provide a leaktight seal for the gasket. All loose paint, scale, dirt, chips, grease and rust must be removed. It continues to be Victaulic's first recommendation that pipe be square cut. 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.

COLUMN 4: **Groove width.** The bottom of groove to be free of loose dirt, chips, rust and scale that may interfere with proper coupling assembly. Maximum permissible radius at bottom of groove is .015"

COLUMN 5: **Groove outside diameter.** The groove must be of 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 cut grooved.



RIGID AND FLEXIBLE RADIUS CUT GROOVE SPECIFICATIONS

Rigid Radius Cut Groove Specifications - Ductile Iron Pipe

1	2			3	4	5		6	7	
Nom Size Inches mm	Pipe Outside Diameter O.D. Inches/mm			Gasket Seat A § +0.00 -0.02	Groove Width B +0.03 -0.02	Groove Diameter C**		Radius R	Min. Allow. Wall Thick T#	
	Basic.	Tolerance				Basic	Tol. +0.000		Cast Iron	Ductile Iron
4	4.80	+0.045	-0.045	0.840	0.375	4.563	-0.020	0.120	0.35	0.32
100	121.9	+1.14	-1.14	21.34	9.53	115.90	-0.51	3.05	8.9	8.1
6	6.90	+0.060	-0.060	0.840	0.375	6.656	-0.020	0.120	0.38	0.34
150	175.3	+1.52	-1.52	21.34	9.53	169.06	-0.51	3.05	9.7	8.6
8	9.05	+0.060	-0.060	0.950	0.500	8.781	-0.025	0.145	0.41	0.36
200	229.9	+1.52	-1.52	24.13	12.70	223.04	-0.64	3.68	10.4	9.1
10	11.10	+0.060	-0.060	1.015	0.500	10.813	-0.025	0.145	0.44	0.38
250	28.19	+1.52	-1.52	25.78	12.70	274.65	-0.64	3.68	11.9	9.7
12	13.20	+0.060	-0.060	1.015	0.500	12.906	-0.030	0.145	0.48	0.40
300	335.3	+1.52	-1.52	25.78	12.70	327.81	-0.76	3.68	12.2	10.2

§ Must be smooth and free of deep pits or swells.

** Groove must be of uniform depth for entire pipe circumference. Groove must conform to "C" diameter shown.

*Ovality, or out-of-roundness, must lie within specified tolerances

Min. Standard wall thickness that should be grooved. Tolerances are to conform to ANSI/AWWA C151/A21.51.

Flexible Radius Cut Groove Specifications Ductile Iron Pipe

1	2			3	4	5		6	7	
Nom Size Inches mm	Pipe Outside Diameter O.D. Inches/mm			Gasket Seat A § +0.00 -0.02	Groove Width B +0.03 -0.02	Groove Diameter C**		Radius R	Min. Allow. Wall Thick T#	
	Basic.	Tolerance				Basic	Tol. +0.000		Cast Iron	Ductile Iron
4	4.80	+0.045	-0.045	0.750	0.375	4.563	-0.020	0.120	0.35	0.32
100	121.9	+1.14	-1.14	19.05	9.53	115.90	-0.51	3.05	8.9	8.1
6	6.90	+0.060	-0.060	0.750	0.375	6.656	-0.020	0.120	0.38	0.34
150	175.3	+1.52	-1.52	19.05	9.53	169.06	-0.51	3.05	9.7	8.6
8	9.05	+0.060	-0.060	0.875	0.500	8.781	-0.025	0.145	0.41	0.36
200	229.9	+1.52	-1.52	22.23	12.70	223.04	-0.64	3.68	10.4	9.1
10	11.10	+0.060	-0.060	0.938	0.500	10.813	-0.025	0.145	0.44	0.38
250	281.9	+1.52	-1.52	23.83	12.70	274.65	-0.64	3.68	11.9	9.7
12	13.20	+0.060	-0.060	0.938	0.500	12.906	-0.030	0.145	0.48	0.40
300	335.3	+1.52	-1.52	23.83	12.70	327.81	-0.76	3.68	12.2	10.2

§ Must be smooth and free of deep pits or swells.

** Groove must be of uniform depth for entire pipe circumference. Groove must conform to "C" diameter shown.

*Ovality, or out-of-roundness, must lie within specified tolerances

Min. Standard wall thickness that should be grooved. Tolerances are to conform to ANSI/AWWA C151/A21.51.

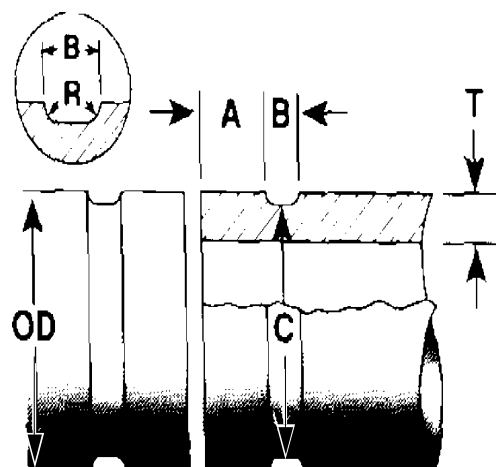
Victaulic groove specifications for cast pipe (gray and ductile) conform to requirements of ANSI/AWWA standard C-606.

For cast pipe, the groove is cut with a radius ("R" dimension) at the corners of the groove base to reduce stress concentration. Grooving dimensions are the same for any one pipe O.D. regardless of pipe class and pressure.

Standard preparation is with a rigid radius groove. Flexible radius groove dimensions may be used to provide expansion/contraction or angular movement allowance at the joint.

The outside surface of the pipe between the groove and pipe end must be smooth and free from deep pits or swells to provide a leak-tight seat for the Victaulic gasket. All rust, loose scale, oil, grease and dirt shall be removed. Peened surfaces may require corrective action to provide leak-tight gasket seal (refer to ANSI/AWWA C-606).

Request 25.05 for Flexible and Rigid Radius Cut Groove Specifications.



PARTS & ACCESSORIES

PARTS ORDERING INFORMATION

1. When ordering parts, the following information is necessary.
2. 1. Tool Model Number: VG-412
3. Tool Serial Number. The serial number can be found stamped on the metal tag riveted to body.
4. Where to send the part(s). Please provide company name and address.
5. To whose attention to send the parts(s).
6. Purchase Order Number for the part.

Order parts from the nearest Victaulic sales office. Consult the back page of this instruction Manual for the nearest Victaulic sales office.

ACCESSORIES

Kit for Grooving & Cutting Steel Pipe 4" - 12".

**Victaulic Tool Company****Tool Shipments:**

1326 Tatamy Road, Easton, PA 18045-7400

Sales & Lease Payments:

P.O. Box 8588-244, Phila.. PA 19171-0244

CUSTOMER CARE CENTER

Phone: 1-800-PICK-Vic (1-800-742-5842)

e-mail: pickvic@victaulic.com

WORLD HEADQUARTERS

P.O. Box 31 • Easton, PA 18044-0031

4901 Kesslersville Road • Easton, PA, USA 18040

Phone: 610/559-3300 • Fax: 610/250-8817

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Victaulic Municipal Division

1818 Vultee Street • Allentown, PA 18103

Phone: 610/559-3488 • Fax: 610/923-3170

Victaulic Technical Services Division

1818 Vultree Street • Allentown, PA 18103

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2628 Remington Road • Odessa, TX 79763

Local Tel.: 915/332-1489 • Local Fax: 915/332-4924

■ **ROCKY MOUNTAIN**

5045 Paris Street • Denver, CO 80239

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Cust.Care: 800/742-5842 • Cust.Fax: 800/448-3542

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Phone: 416/675-5575 • Fax: 416/675-5565 • e-mail: viccanda@vuctaulic.com

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