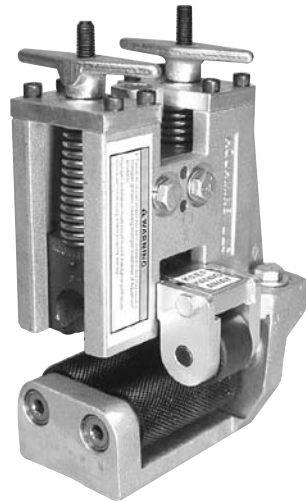


APG

CUT GROOVING/BEVELING TOOL FOR 4 – 12-INCH/114.3 – 323.9-MM AQUAMINE® PIPE



WARNING



! WARNING



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

- Before operating or servicing the APG tool, read all instructions in this manual and all warning labels on the tool.
- This is a manually-driven tool. **DO NOT** use a power drive with this tool.
- Wear safety glasses, hardhat, foot protection, and hearing protection while working with tools.
- Save this operating and maintenance manual.

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

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HAZARD IDENTIFICATION


Definitions for identifying the various hazard levels are provided below.

 This safety alert symbol indicates important safety messages. When you see this symbol, be alert to the possibility of personal injury.

Carefully read and fully understand the message that follows.

 **WARNING**

- The use of the word “WARNING” identifies the presence of hazards or unsafe practices that could result in death or serious personal injury if instructions, including recommended precautions, are not followed.

 **CAUTION**

- The use of the word “CAUTION” identifies possible hazards or unsafe practices that could result in personal injury and product or property damage if instructions, including recommended precautions, are not followed.

NOTICE

- The use of the word “NOTICE” identifies special instructions that are important but not related to hazards.

OPERATOR SAFETY INSTRUCTIONS

The APG tool is designed only for cutting grooves into 4 – 12-inch/114.3 – 323.9-mm Aquamine PVC pipe and for producing a bevel on the pipe end that is necessary for proper installation of Aquamine spline couplings. This tool is designed only for manual operation and must never be used with a power drive. Use of this tool requires dexterity and mechanical skills, as well as sound safety habits. Although this tool is designed for safe, dependable operation, it is impossible to anticipate all combinations of circumstances that could result in an accident. The following instructions are recommended for safe operation of this tool. The operator is cautioned to always practice “safety first” during each phase of use, including setup and maintenance. It is the responsibility of the owner, lessee, or user of this tool to ensure that all operators read this manual and fully understand the operation of this tool.

Read this manual before operating or servicing this tool. Become familiar with the tool's operations, applications, and limitations. Be particularly aware of its specific hazards. Store this manual in a clean area where it is always readily available. Additional copies of this manual are available upon request through Victaulic.

- This tool is designed ONLY for cutting grooves into Aquamine PVC pipe sizes listed in the “Aquamine Pipe End Details” section of this manual.**
- Avoid using the tool in dangerous environments.** Keep the work area well lit. Allow sufficient space to operate the tool properly.
- Inspect the equipment.** Before using the tool, check all moveable parts for any obstructions. Make sure tool components are installed and adjusted properly.
- Wear proper apparel.** Do not wear loose clothing, jewelry, or anything that can become entangled in moving parts.
- Wear protective items when working with tools.** Always wear safety glasses, hardhat, foot protection, and hearing protection.
- Stay alert.** Do not operate the tool if you are drowsy from medication or fatigue. Avoid horseplay around the equipment.
- Keep visitors away from the immediate work area.** All visitors should be kept a safe distance from the equipment at all times.
- When using this tool on an elevated floor or platform, the area below must remain clear of all personnel.**
- Keep work areas clean.** Keep the work area around the tool clear of any obstructions that could limit the movement of the operator. Clean up any oil or other spills.
- Support the work.** Support the pipe in a chain-type pipe vise that is mounted to a workbench or a stand. The workbench or stand must be secured to the floor.
- Do not reach inside the pipe/tubing end during tool operation.** Keep hands and loose hand tools away from moving components.
- Do not over-reach.** Maintain proper footing and balance at all times.
- Do not force the tool.** Do not force the tool to perform any functions beyond their capabilities. Do not overload the tool.
- Maintain tools with care.** Keep tools clean at all times to ensure proper and safe performance. Follow the instructions for lubricating tool components.
- When tools are not in use, store them in a dry, secure place.**
- Use only Victaulic replacement parts and accessories.** Use of any other parts may result in a voided warranty, improper operation, and hazardous situations.
- Do not remove any labels from the tool.** Replace any damaged or worn labels.

INTRODUCTION

⚠ WARNING

- **DO NOT use a power drive with the APG tool.**
- **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.**

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

NOTICE

- **Drawings and/or pictures in this manual may be exaggerated for clarity.**
- **The tool, along with this operating and maintenance instructions manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.**

The APG tool is a manually-operated, orbital tool used for producing cut grooves and bevels in Aquamine PVC pipe for proper installation of Aquamine spline couplings. This tool must never be used with a power drive.

Tool operation can be accomplished on pipe that is restrained in a pipe vise or on supported, in-place piping that is depressurized and drained. For in-place applications, the piping system must be braced temporarily to support the loads produced by operating the tool.

During operation, the APG tool grips the pipe wall between two external and internal support rolls. The tool is designed to travel around the pipe counterclockwise while the drive nut is turned in a clockwise direction. The “self-tracking” internal support rolls cause the APG tool to pull itself tightly against the pipe end.

Tool bits, which do the cutting, are spring-loaded against the pipe and are made from high-speed tool steel; these tool bits ARE NOT suitable for re-sharpening. Material is removed

until the depth stops, incorporated within the tool bit, contact the pipe, thereby ensuring groove and bevel depth uniformity. Refer to the “Spline Groove Tool Bit Selection” table for further information.

⚠ CAUTION

- **This tool must be used ONLY for cut grooving/beveling Aquamine PVC pipe sizes designated in the “Aquamine Pipe End Details” section of this manual.**

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

RECEIVING THE TOOL

The APG tool is packaged individually in a heavy cardboard container. Upon receipt of the tool, make sure all necessary parts are included. If any parts are missing, contact Victaulic.

CONTAINER CONTENTS

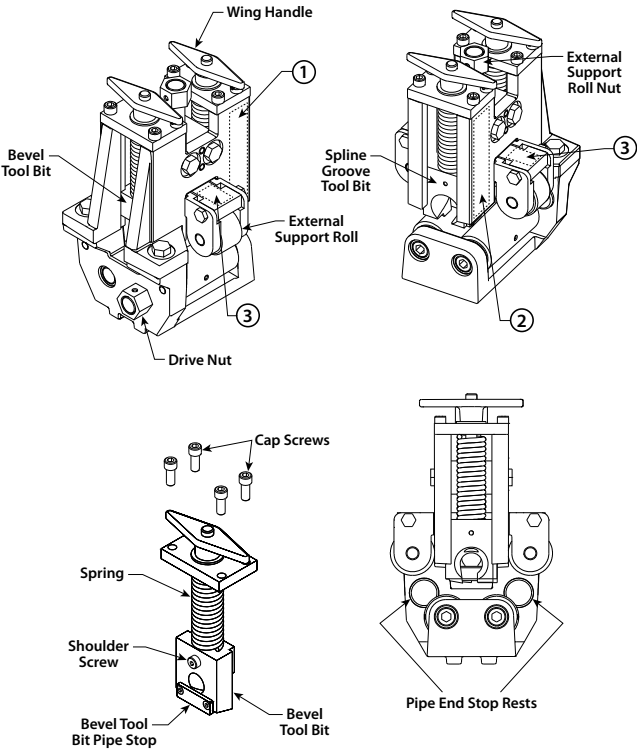


Qty.	Description
1	APG Tool with Spline Groove Tool Bit and Bevel Tool Bit Installed for Cut Grooving 4 – 6-inch/114.3 – 168.3-mm Aquamine Pipe
1	Carrying Bag
1	Drive Crank
1	3/16-inch Key
1	1/8-inch Key
1	1/16-inch Key
2	Operating and Maintenance Instructions Manual
2	Repair Parts List

TOOL NOMENCLATURE

NOTICE

- Drawings and/or pictures in this manual may be exaggerated for clarity.
- The tool, along with this operating and maintenance instructions manual, contains trademarks, copyrights, and/or patented features that are the exclusive property of Victaulic.



①

⚠ WARNING

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

- Before using or servicing this tool, read and understand the Instruction and Maintenance Manual and all warning labels on the tool.
- Always wear safety glasses, hard hat and foot protection.

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

2718 Rev.A 4/99 R022413JBL2

②

⚠ WARNING

- Make sure the proper spline groove tool bit and bevel tool bit for the pipe size to be grooved are installed in the tool before attempting to groove/bevel Aquamine® pipe.

Failure to follow this instruction will cause improper product assembly, resulting in joint failure, serious personal injury, and property damage.

2760 Rev.B R02726JBL

CHAIN-TYPE PIPE VISE SETUP

1. The APG tool is designed for field or shop use. Select a location for the tool by taking into consideration the following factors:
 - 1a. Adequate space to handle pipe lengths
 - 1b. A firm and level surface for safe tool operation
 2. Fasten a stand or workbench securely to the floor.
 3. Mount a chain-type pipe vise to the secured stand or workbench. The chain-type pipe vise must be capable of supporting the weight of the pipe and tool (tool weighs approximately 13 pounds/5.9 kilograms) and must be capable of resisting the torque required to operate the tool (approximately 20 ft-lbs/27 N•m). The chain-type pipe vise should be flush with or slightly overhang the edge of the stand or workbench to permit the tool to rotate freely without being obstructed.
- NOTE:** The APG tool requires 7 ½ inches/190 mm radial clearance around the pipe OD for proper operation.

GROOVE-IN-PLACE SETUP

⚠ CAUTION

- Pipe hangers must be capable of handling the weight of the APG tool (approximately 13 pounds/5.9 kilograms), plus the torque required to operate the tool during grooving (approximately 20 ft-lbs/27 N•m).

Failure to follow this instruction could cause damage to the piping system, resulting in property damage.

Piping that is installed in a system may be grooved/beveled in place, provided that the piping is supported securely. **NOTE:** The APG tool requires 7 ½ inches/190 mm radial clearance around the pipe OD for proper operation. **The piping system must be depressurized and drained before attempting to groove/bevel the pipe.**

PREPARING PIPE FOR GROOVING/BEVELING

For proper operation and production of grooves and bevels that are within Victaulic specifications, the following pipe preparation steps must be followed.

1. Pipe ends must be square-cut (refer to the “Aquamine Pipe End Details” section).
2. All dirt and other foreign material must be removed from the interior and exterior surfaces of the pipe ends.

⚠ CAUTION

- **All foreign material must be removed from the interior and exterior surfaces of the pipe ends.**

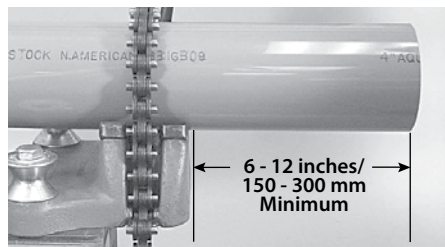
Failure to prepare pipe properly may cause distorted grooves and/or bevels, resulting in incomplete coupling assembly, joint leakage, and property damage.

PIPE LENGTH REQUIREMENTS

The minimum pipe length that can be grooved with an APG tool is 18 inches/457 mm.

MOUNTING PIPE IN THE CHAIN-TYPE PIPE VISE

1. Make sure all instructions in the “Chain-Type Pipe Vise Setup” section have been followed.



2. Position the pipe to overhang the pipe vise approximately 6 – 12 inches/150 – 300 mm so that the tool can groove the pipe without being obstructed by the pipe vise, pipe vise stand, or workbench.

CHECKING AND ADJUSTING THE TOOL PRIOR TO GROOVING/BEVELING

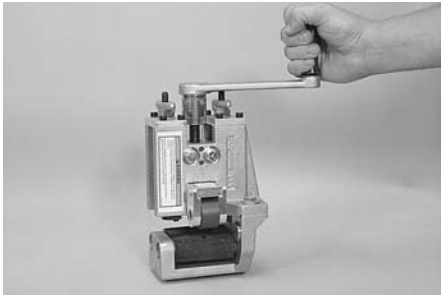
CAUTION

- Always verify that the correct cut groove and bevel tool bits are installed in the tool prior to grooving Aquamine PVC pipe.

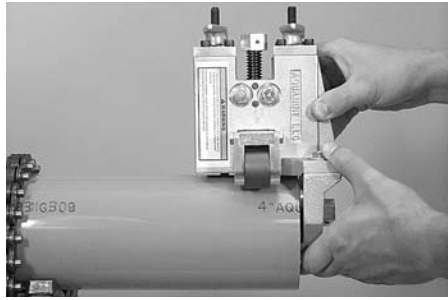
Failure to follow this instruction will cause improper grooves, resulting in joint failure, personal injury, and property damage.

Verify that the correct spline groove tool bit and bevel tool bit are installed in the tool for the size of Aquamine PVC pipe to be grooved. If the tool bits need to be changed, refer to the “Spline Groove Tool Bit Removal” section, the “Spline Groove Tool Bit Installation” section, the “Bevel Tool Bit Removal” section, and the “Bevel Tool Bit Installation” section.

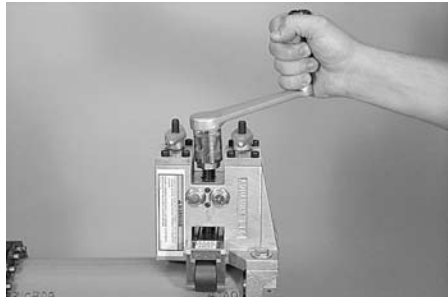
MOUNTING THE APG TOOL ONTO THE PIPE



1. Using the supplied drive crank, turn the external support roll nut counterclockwise to retract the external support rolls fully.



2. Mount the tool by sliding the tool onto the pipe end, as shown above. Push the tool fully onto the pipe until the pipe end stop rests against the pipe end.



3. Using the supplied drive crank, turn the external support roll nut clockwise to advance the external support rolls. Continue advancing the external support roll nut until the support rolls (both external and internal) are in firm contact with the pipe. **NOTE:** For increased torque and efficiency, a $1\frac{1}{4}$ -inch socket with a wrench that is a minimum of 16 inches-400 mm in length (not supplied) can be used instead of the supplied drive crank.

GROOVING/BEVELING OPERATION

⚠ CAUTION

- This tool must be used **ONLY** for cut grooving/beveling Aquamine PVC pipe designated in the "Aquamine Pipe End Details" section of this manual.

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

1. Before grooving/beveling, make sure all instructions in the previous sections of this manual have been followed.



2. Check tool stability and tracking on the pipe by using the supplied drive crank to turn the drive nut clockwise. This will cause the tool to travel around the pipe in a counterclockwise direction. Rotate the tool around the pipe several times and observe the stability and tracking of the tool. The tool should rotate around the pipe smoothly without slipping. If the tool does not rotate smoothly, tighten the external support roll nut an additional $\frac{1}{4}$ turn. Repeat this step until the tool rotates smoothly around the pipe.

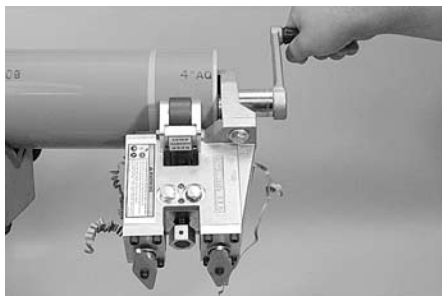
⚠ CAUTION

- **DO NOT over-tighten the external support roll nut.**

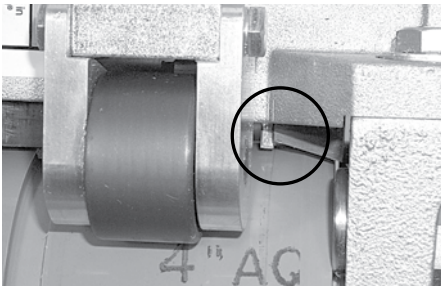
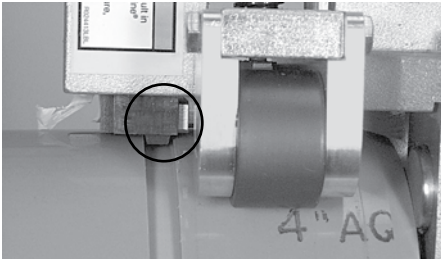
Over-tightening the external support roll nut will result in shortened bearing life and other tool damage.



3. Loosen both wing handles to allow the tool bits to become spring-loaded against the pipe. Back off the wing handles so that there is at least $\frac{1}{4}$ inch/6.4 mm space between the top surface of the tool and the wing handles.

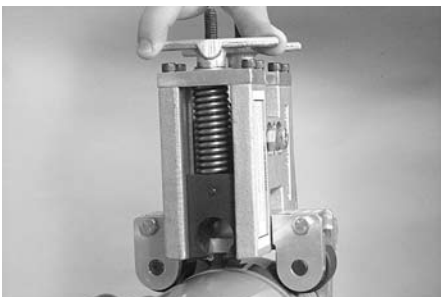


4. Using the supplied drive crank, turn the drive nut clockwise. If the tool slips during grooving/beveling, refer to step 2 on this page to rectify the problem.



5. Continue grooving/beveling until both tool bits have stopped cutting. This occurs when both pipe stops contact the pipe.
NOTE: If the pipe stops do not contact the pipe, refer to the "Troubleshooting" section. The spline grooving tool bit **MUST** contact the pipe to ensure that the groove and bevel will conform to the specifications listed in the "Aquamine Pipe End Details" section.

DISMOUNTING THE TOOL

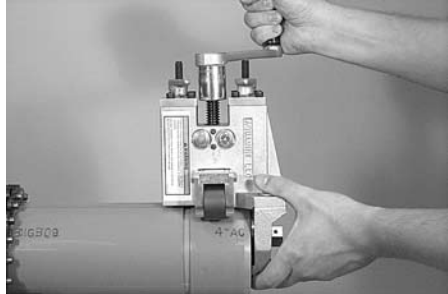


1. Tighten the wing handles to retract both tool bits completely. The tool bits are retracted completely when the springs are compressed fully.

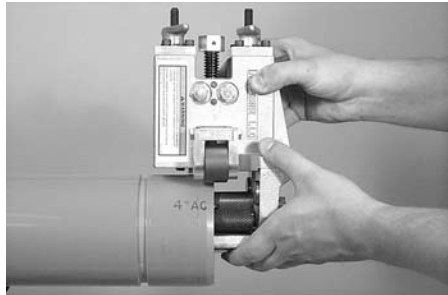
CAUTION

- Always support the tool while retracting the support rolls.

Failure to follow this instruction may cause the tool to fall off the pipe end, resulting in personal injury and tool damage.

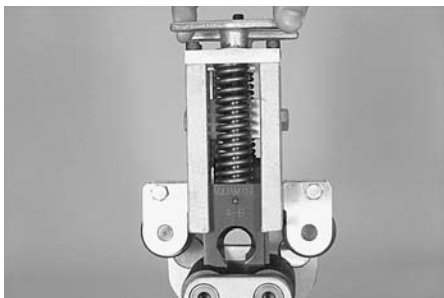


2. Support the tool on the pipe end. Turn the external support roll nut counterclockwise to loosen the support rolls.

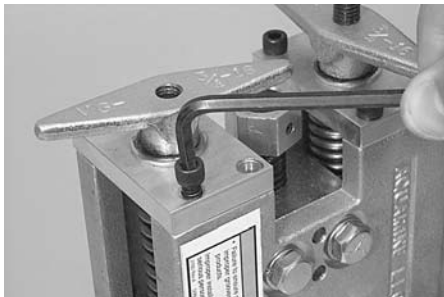


3. Slide the tool off the pipe end.

SPLINE GROOVE TOOL BIT REMOVAL



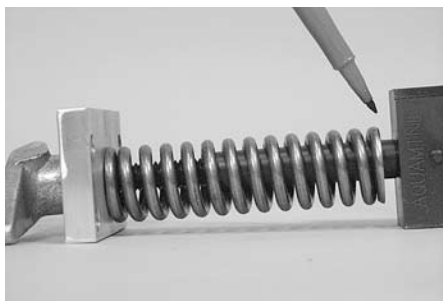
1. Loosen the wing handle to extend the spline groove tool bit until it is positioned just before contact occurs with the internal support rolls.



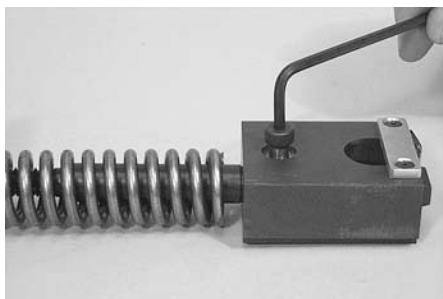
2. Using the supplied $\frac{3}{16}$ -inch hex key, remove the four cap screws, as shown above.



3. Lift the spline groove tool bit assembly out of the tool.

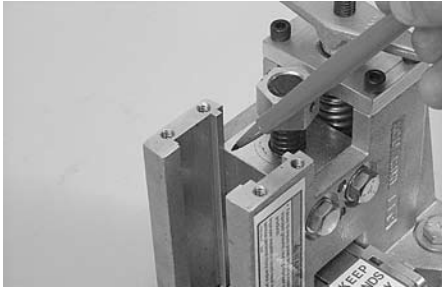


4. Make sure the spring is unloaded completely by verifying that the spring is free to rotate. If not, additional loosening of the wing handle is required.

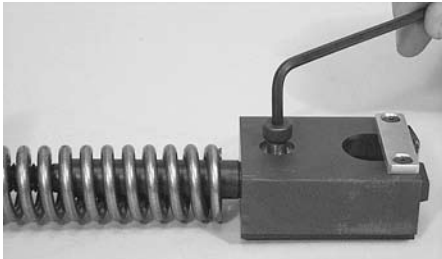


5. Using the supplied $\frac{1}{8}$ -inch hex key, remove the shoulder screw from the spline groove tool bit assembly, as shown above. Remove the spline groove tool bit.

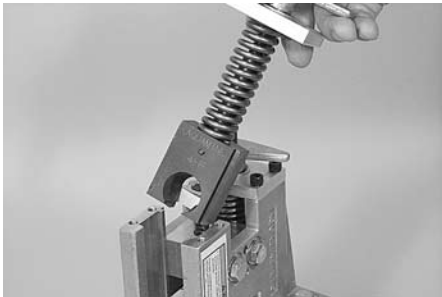
SPLINE GROOVE TOOL BIT INSTALLATION



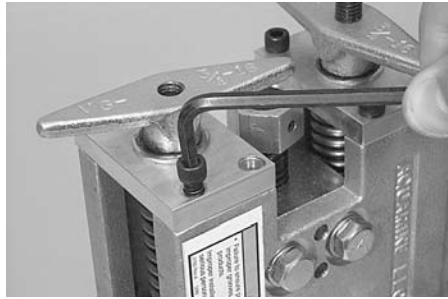
1. Clean the keyways to remove any dirt and foreign material.
- 1a. Apply a light oil (SAE-30) to the keyways.



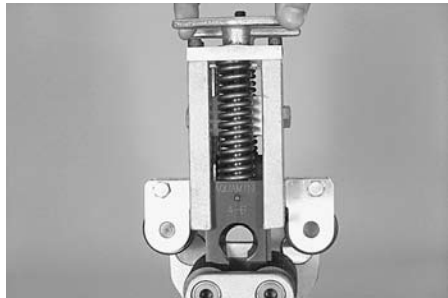
2. Refer to the "Spline Groove Tool Bit Selection" table to select the appropriate replacement tool bit. Install the appropriate tool bit onto the spline groove tool bit assembly by tightening the shoulder screw with the supplied $\frac{1}{8}$ -inch hex key, as shown above.



3. Slide the spline groove tool bit assembly back into the tool, as shown above.

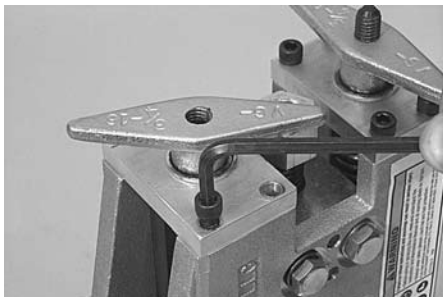


4. Using the supplied $\frac{3}{16}$ -inch hex key, re-install the four cap screws, as shown above.



5. Tighten the wing handle to move the tool bit away from the internal support rolls.

BEVEL TOOL BIT REMOVAL



1. Using the supplied $\frac{3}{16}$ -inch hex key, remove the four cap screws, as shown above.

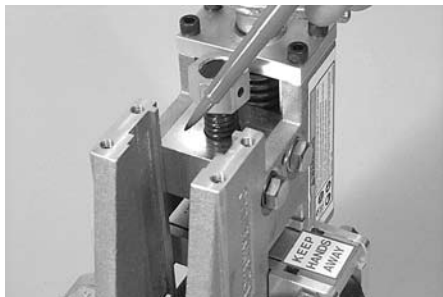


2. Lift the bevel tool bit assembly out of the tool.

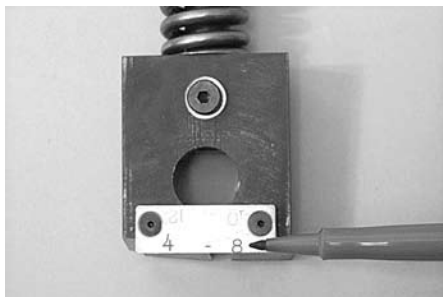


3. Using the supplied $\frac{1}{16}$ -inch hex key, remove the two cap screws from the bevel tool bit assembly. Remove the bevel blade pipe stop.

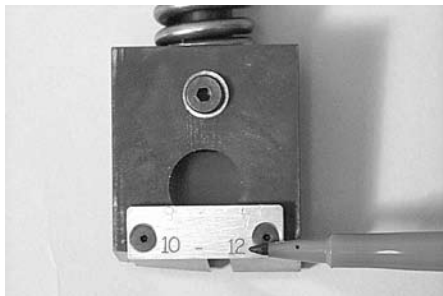
BEVEL TOOL BIT INSTALLATION



1. Clean the keyways to remove any dirt and foreign material.
 - 1a. Apply a light oil (SAE-30) to the keyways.

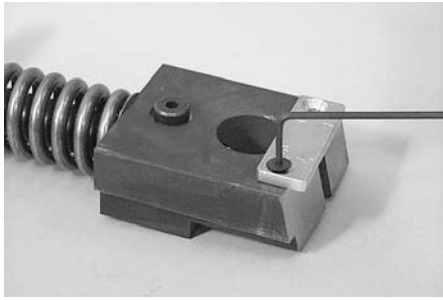


4 – 8-INCH/114.3 – 219.1-MM PIPE SIZES

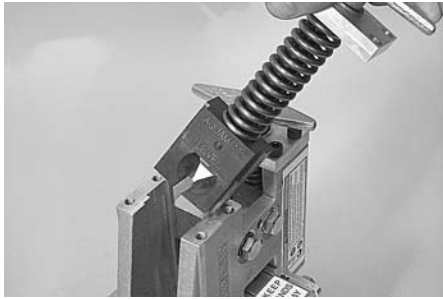


10 – 12-INCH/273.0 – 323.9-MM PIPE SIZES

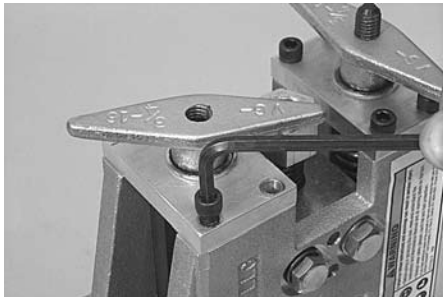
2. Choose the correct pipe stop for the appropriate pipe size. The pipe sizes are engraved on the bevel blade pipe stop, as shown above.



3. Install the appropriate bevel blade pipe stop into the bevel tool bit assembly by tightening the two cap screws with the supplied $\frac{1}{16}$ -inch hex key, as shown above.



4. Slide the bevel tool bit assembly back into the tool, as shown above.

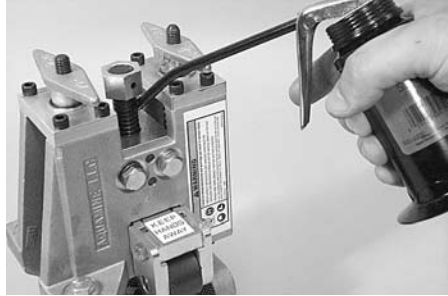


5. Using the supplied $\frac{3}{16}$ -inch hex key, re-install the four cap screws, as shown above.

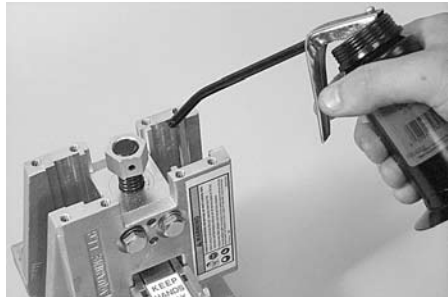
MAINTENANCE

This section provides information on keeping APG tools in proper operating condition.

1. Always keep the tool free from chips to prevent moving components from binding.



2. Regular lubrication of the feed screw threads is required. 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 feed screw.



3. On a regular basis, disassemble the spline groove tool bit assembly and the bevel tool bit assembly by following the applicable removal instructions in this manual. Clean the keyways to remove all debris and apply a light oil (SAE 10W-30 or equivalent) to the keyways. Re-assemble the spline groove tool bit assembly and the bevel tool bit assembly by following the application installation instructions in this manual.

TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Unable to mount tool onto pipe	Spline groove tool bit and/or bevel tool bit not retracted fully	Retract the tool bits completely by turning the wing handles clockwise. The tool bits are retracted completely when the springs are compressed fully.
	Incorrect spline groove tool bit and/or bevel pipe stop positioning	Refer to the "Spline Groove Tool Bit Selection" table to select the proper tool bit. Perform the steps contained in the tool bit removal and installation sections.
Tool does not travel around pipe when cranked	Insufficient pressure is being exerted by the external support rolls	Tighten the external support roll nut an additional ¼ turn. Re-test the tool for stability and continue to tighten the external support roll nut, as required.
	Plastic or dirt build-up is present on the knurled internal support rolls	Remove accumulation from the knurled internal support roll with a stiff wire brush.
	Pipe end not cut square	Refer to the "Preparing Pipe for Grooving" section and the "Aquamine Pipe End Details" section for pipe preparation requirements.
	Knurled support rolls are worn	Inspect the support rolls for worn knurls. Replace the support rolls if damage or wear is present.
Tool does not groove and/or bevel	Tool bits are not making contact with pipe	The wing handles are not loosened enough. Refer to the "Grooving Operation" section to loosen the wing handles.
	The keyway for the spline groove tool bit assembly contains foreign material	Refer to the "Spline Groove Tool Bit Removal" section and the "Spline Groove Tool Bit Installation" section to clean and lubricate the keyway.
	Tool is being driven backward	Crank the drive nut in the clockwise direction. Refer to the "Grooving Operation" section.
Tool bit pipe stop does not contact pipe	Worn cutting edge on tool bit	Install a new tool bit. Refer to the "Spline Groove Tool Bit Removal" section and the "Spline Groove Tool Bit Installation" section.
	The keyway for the spline groove tool bit assembly contains foreign material	Refer to the "Spline Groove Tool Bit Removal" section and the "Spline Groove Tool Bit Installation" section to clean and lubricate the keyway.
	The wing handles are not loosened enough.	Refer to the "Grooving Operation" section to loosen the wing handles.

Nominal Pipe Size inches/ Actual mm	SDR Designation	Maximum Working Pressure Rating psi/kPa*	Dimensions – inches/mm									
			"P" Bevel		"D" Groove Depth				"G" Groove Width			
			Minimum	Maximum	Basic	Maximum	Minimum	Maximum	Basic	Maximum	Minimum	Maximum
6 168.3	SDR 21	200 1380	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.350 8.9	0.375 9.5	0.325 8.3	0.060 1.5	3.000 76.2
6 168.3	SDR 26	160 1105	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.350 8.9	0.375 9.5	0.325 8.3	0.060 1.5	3.000 76.2
8 219.1	SDR 12.4	350 2415	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.500 12.7	0.520 13.2	0.480 12.2	0.060 1.5	3.100 78.7
8 219.1	SDR 17	250 1725	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.500 12.7	0.520 13.2	0.480 12.2	0.060 1.5	3.100 78.7
8 219.1	SDR 21	200 1380	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.500 12.7	0.520 13.2	0.480 12.2	0.060 1.5	3.100 78.7
8 219.1	SDR 26	160 1105	0.187 4.7	0.250 6.4	0.130 3.3	0.140 3.6	0.120 3.0	0.500 12.7	0.520 13.2	0.480 12.2	0.060 1.5	3.100 78.7
10 273.0	SDR 26	160 1105	0.187 4.7	0.250 6.4	0.200 5.1	0.210 5.3	0.190 4.8	0.500 12.7	0.520 13.2	0.480 12.2	0.100 2.5	3.500 88.9
12 323.9	SDR 26	160 1105	0.625 15.9	0.687 17.4	0.200 5.1	0.210 5.3	0.190 4.8	0.500 12.7	0.520 13.2	0.480 12.2	0.100 2.5	3.500 88.9

† These pipe sizes have thickened ends. DO NOT cut and groove pipe outside of the thickened ends. Victaulic offers plain-end couplings and adapters for these applications.

* Maximum working pressure at 73°F / 23°C

"P" Bevel: The pipe end must be beveled to ease insertion past the Aquamine coupling seal and to prevent damage to the seal.

"D" Groove Depth: The groove depth shall not vary more than the tolerance listed.

"G" Groove Width: The bottom of the groove must be free of loose dirt and debris that may interfere with Aquamine coupling spline insertion. Corners at the bottom of the groove must be radiused according to the "R1" dimension listed in the table above.

SPLINE GROOVE TOOL BIT SELECTION

Nominal Pipe Size inches/ Actual mm	SDR Designation	Spline Groove Tool Bit Identification Marking	Spline Groove Tool Bit Part Number
4 114.3	SDR 12.4	4 – 6	R-K04-413-P04
	SDR 17		
	SDR 21		
	SDR 26		
6 168.3	SDR 12.4	4 – 6	R-K04-413-P04
	SDR 17		
	SDR 21		
	SDR 26		
8 219.1	SDR 12.4	8 *	R-K08-413-P08
	SDR 17		
	SDR 21		
	SDR 26		
10 273.0	SDR 26	10 – 12 *	R-K12-413-P12
12 323.9	SDR 26	10 – 12 *	R-K12-413-P12

* Spline groove tool bits for 8-inch/219.1-mm, 10-inch/273.0-mm, and 12-inch/323.9-mm pipe are sold separately.

APG

CUT GROOVING/BEVELING TOOL FOR 4 – 12-INCH/114.3 – 323.9-MM AQUAMINE® PIPE

For complete contact information, visit www.victaulic.com

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