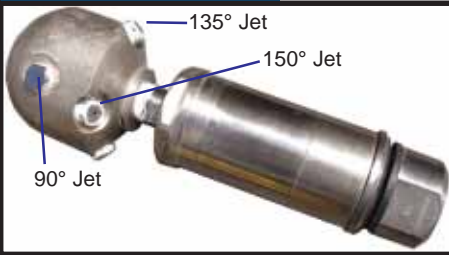


NewsBlast

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July 2004

Jetting PVC Drain Pipe Without Damage



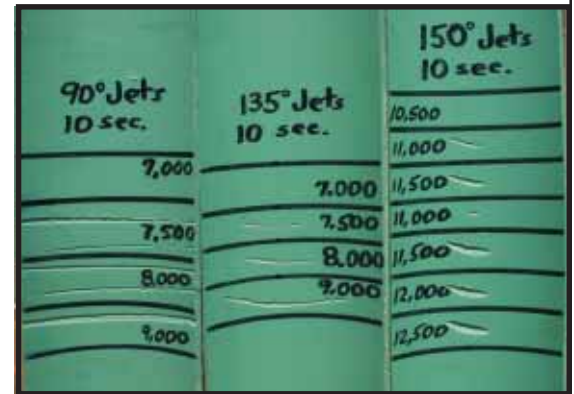
Warthog WH-3/4 used for testing

Having published our test results on vitrified clay pipe in the May issue, we were asked about PVC drain pipe. Because of its light weight and economical installation, PVC is widely used in many localities. So we conducted tests to determine how PVC sewers might be jetted with confidence that no damage will result.

A **Warthog WH-3/4** test nozzle with two jets at three different angles was used to see what pressure was required to damage the pipe. The **Warthog** was run 10 seconds at each jet angle, laying on the pipe surface.

The photos tell the whole story. At jetting pressures below 6,000 psi, waterjets will not damage PVC pipe.

Finally, to simulate the most severe conditions, we ran 90° jets for two minutes, at various pressures. If pressure is at or above the threshold required to initiate damage, increased jetting time results in increased damage.



Jets positioned normal to the surface produce damage at the lowest pressure.



Contact time at pressures above the damage threshold is important

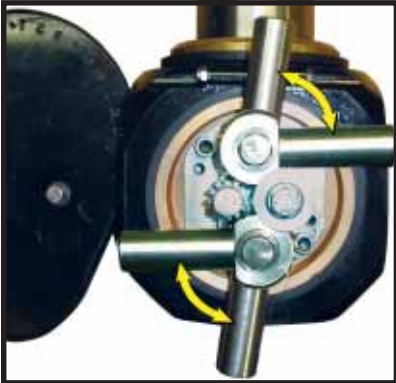
Warthog™ In Holland

Great results, that's what sells the **Warthog™**. Thanks to StoneAge distributor Salotech International, whose customer SITA Services claims the **WG-1** is 6 times as effective as the conventional sewer cleaning nozzles they were accustomed to using in this grease-restricted line in Delft, Holland. The power of controlled rotation really does make a difference, as the **Warthog™** clearly demonstrates. Phone Salotech at 31-186-621484 in Oud -Beijerland for knowledgeable, reliable waterjetting equipment in West Europe.



Hurricane™ 3D Troubleshooting Guide

The *Hurricane* combines the proven technology of the *BJV-M 2D*, with gearing to produce 3-dimensional jet action. Adjustable banjo nipples make the tool unique, by balancing jets for operation with a wide variety of pumps. They are geared together to synchronize the angle setting. If replaced, it's important to mesh the banjo nipples at the same angle, or rotation and balance will be severely effected. After adjusting banjo nipples, it's important to torque the bolts to 100 ft-lb to prevent loosening under pressure. The *Hurricane* has specified angle settings found in the Operator's Manual, as well as in the 2004 Catalog. If the recommended setting does not produce the desired rotation speed, it may be safely increased up to 2 gradations. It's also important that the two nozzle tips have matching orifice sizes.



the two nozzle tips have matching orifice sizes.

If It Will Not Rotate

1. Check for correct banjo nipple angle setting, and proper nozzle tip orifices.
2. Remove nozzle tips and check flow straighteners for foreign objects. Even a partial blockage can reduce flow, unbalance torque, and stop rotation.
3. Check that black plastic cover seals do not have their lips pinched between the covers and bronze gears. This frequently happens when plastic covers are replaced without first removing the seals. Check that cover halves are aligned and not interfering with the gears. Any debris buildup on the gears or inside the cover halves can slow rotation speed. The *Hurricane* can be operated safely with the plastic covers removed for troubleshooting purposes.
4. Horizontal operation requires a 1-2 gradation increase in the banjo nipple setting. The tool is not balanced horizontally, and must overcome the pendulum effect to maintain rotation.
5. The gap between the body and rotor is very close, dents, damage or clamping of the body of the tool can close the gap and prevent rotation.
6. Dirty or low viscous fluid level inside the main body will jeopardize tool performance and longevity; but is generally not the cause of slow rotation. The fluid is the braking mechanism and bearing lubrication, and must be routinely checked for peak performance. It's a simple procedure to unscrew the inlet nut and check level and cleanliness. Always remove the port plug from the inlet nut when reinstalling to allow excess fluid to escape.

Other Maintenance Tips

1. Always blow out excess water with

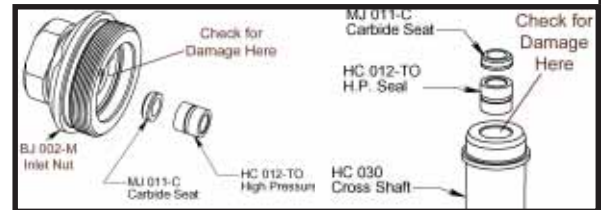
compressed air when storing the tool, to prevent internal corrosion.

2. Routinely check viscous fluid level and cleanliness in the main body. Be sure the inlet nut is snugly tightened down before operation. If this nut works loose, the tool may fall, causing expensive damage.
3. Stainless steel has a tendency to gall, causing unreparable damage. So use anti-seize compound on all threaded connections.
4. Repeated leakage of high pressure water is a sign of wear, and need to replace certain parts:

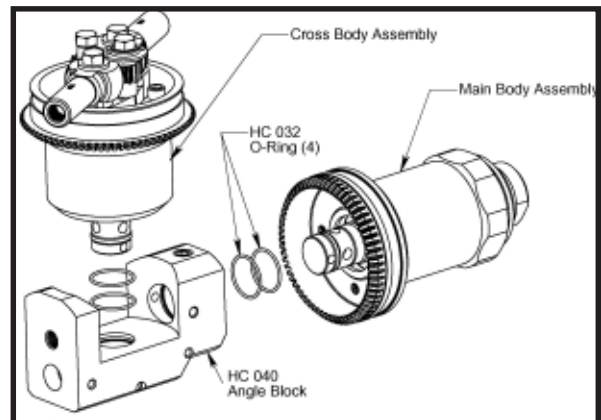
High Pressure Seal Sealing Surfaces -

Where the seal contacts the seat, shaft bores will wear. The enlarged bore allows faster extrusion of the plastic seal around the seat, increasing torque and slowing rotation. The shaft must be replaced to repair. The back side of the inlet nut and banjo assembly sometimes gets damaged where the high pressure seat fits. This can be repaired by machining flat.

Angle Block Shafts - Older tools may



develop leaks past the shaft o-rings. Signs of leaking at these locations should be repaired immediately or expensive damage may result. If the shaft and angle block connection washes out, no repair is possible other than replacing the parts. When reinstalling either shaft into the angle block, carefully align the holes before driving the roll pin through. If the pin damages the o-ring sealing surface of the shaft, leaking results. Always replace shaft o-rings when assembling either shaft into the angle block.

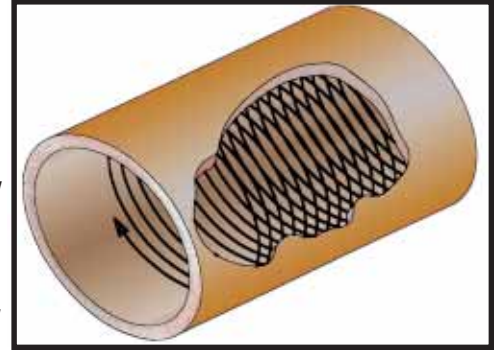


How Do They Work?

Self-Rotating 2D Nozzles

StoneAge specializes in manufacturing accessory tools to get the most out of our customers' pumps for the most efficient cleaning. We are often asked "How does it work?" after we recommend a solution. This article is the first in a series that will help explain how our equipment works and why we recommend certain approaches to different cleaning applications.

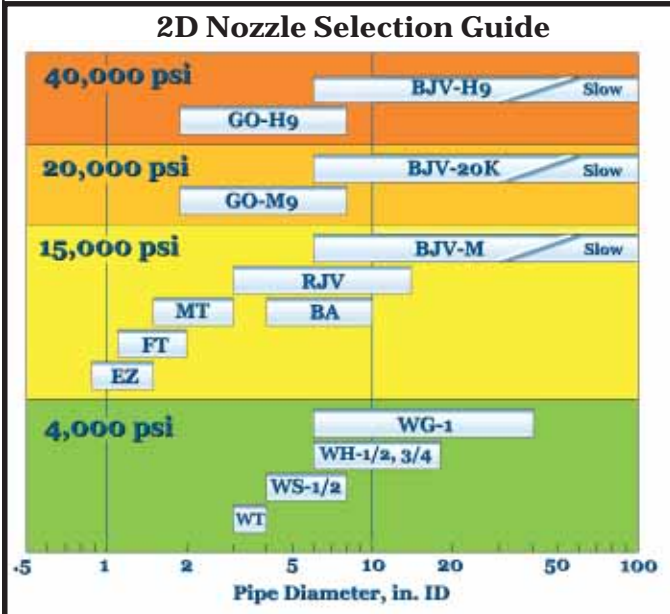
There are two reasons why StoneAge equipment is so productive; *rotation* and *speed control*. All of StoneAge's tools rotate for the most efficient cleaning. *Rotation* of high pressure rotary nozzles provides the most coverage. This illustration shows that the jet path acts like threads on a bolt providing complete coverage of the inside of a pipe in a single pass. The *speed control*



is the use of a governor to be able to control the rotation speed of the nozzle head to meet the demands of different cleaning applications. A slower spinning tool allows it's jets time to remove more material.

Which tool should I use? StoneAge offers a wide selection self rotary tools to meet many different waterblast applications. Which tool to pick can be challenging. The main issues to help determine which tool to use are the maximum psi rating for the pump you are using and the size of pipe to be cleaned. To help illustrate which tool to choose refer to our tool selection guide.

What makes it rotate? To get our self-rotary nozzles to spin we locate the nozzles at different distances from the center of the head. We call this distance from center the "R Value". The different R Value offsets are to match



different pump capacities. For example, the smaller the pump capacity, or flow, the further from center we offset the ports to generate more spin. This equals a higher R Value. The R Value is stamped in the head of every rotating nozzle head. Most of our tools only have a couple of offset R Values but we can demonstrate this principal with the BJV-M with its wide selection of offsets:

BJV-M Offsets

Offset, R, Inch	0.60	0.35	0.20	0.12
Flow Range, gpm	10-18	18-32	32-55	55-100

What keeps it from spinning too fast? We use three types of speed governors to keep our tools from spinning too fast. The first is a viscous fluid that is channeled around a shaft rotor, and through bearings. These tools include the BJV and RJV. The viscosity, or thickness, of the fluid determines how fast the tool will spin. The second method is centrifugal control. With centrifugal control, spinning weights spread apart until they create friction by contacting an outer sleeve, slowing the rotation. Tools with centrifugal control include the Gopher and Barracuda. Finally, we have a stack up of discs that circulate viscous fluid. The Badger uses this newest technology.

In summary, we balance two forces working against each other. The nozzle head spins because of its R value; but the governor slows the rotation with its braking action.

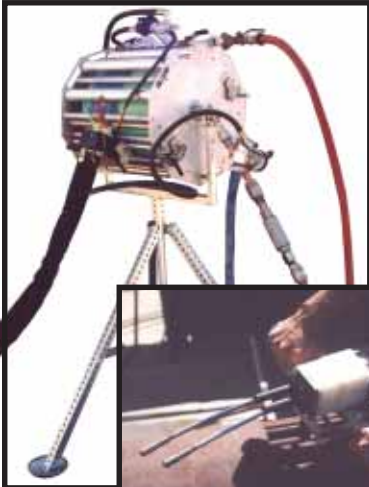


Sneak Preview - New Tool Development

This dual lance **Sabertooth** unit is being tested at the request of a industrial service contractor who already owns 6 single-lance units at a single location.

For obvious reasons, we can't say who it is, what they do, or where they do it. But the **Sabertooth** has enabled them to do it very well! We appreciate field feedback from such customers, whose observations have led to constant improvement in the productivity of this design. Features like on-board pressure dump, convenient hand controls, easily-set stroke speed and limits - all mean thorough cleaning and productivity. The **Sabertooth** relieves the operator from the back-breaking hand work usually involved with vertical tube cleaning. The plant gets a heat exchanger back on-line sooner than ever before, with heat transfer completely restored for the first time since new.

Even with our extensive line of BJ Centralizers, sometimes we need to build a custom design for unusual requirements! StoneAge's Ron Fadell with the **BJ288-XXL Centralizer** built recently to clean really big piping. This device can be used with the **BJV 2D Nozzle** or the **SG-60 Air Powered Assembly**, with long extension nipples that position the jets close to the pipe wall.



40 Kpsi Deck Blaster

The **DB-UH Deck Blaster** was introduced in February at the Pumper/Cleaner Environmental Expo in Nashville. If you need to remove epoxy coatings, scale, or very hard deposits, this is the right tool. It was developed for productive surface preparation to white metal, NACE NO. 5/SSPC-SP12 standards. Several unique features make the DB-UH, the most productive ultra-high pressure deck blaster available. Firstly, the unit is self-propelled, and speed is controlled. That makes it possible to setup for the most productive speed, and then reproduce the best conditions on path after path.

The self-propulsion clutch can be disengaged to allow easy manual manouvering around obstacles. Other great features include the on-board pressure dump, vacuum recovery of water and debris, and adjustable height for the rotating jets.



Welcome Elizabeth Johns



Elizabeth Johns

Experienced with all phases of shipping, Liz is eager to make sure our customers receive their orders in a timely, economical manner.

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