Banshee® Beetle Tube Spinner (BT12, BT18, BT25)

For applicable patents see:
http://www.sapatents.com

The **Banshee Beetles** are self-rotating swivels designed for tube cleaning. The diameter of the tool and inlet nut connection determine the model and part number. The tool can be used at operating pressures from 8,000 psi to 22,000 psi, depending on the inlet connection and head jetting. Standard tool part numbers are shown in Table 1 along with corresponding inlet connections, pressures and flows.

Each tool is capable of a range of pressures and flows. The maximum pull of the standard tools range from 9 to 20 pounds. The nozzle head/shafts are wear items that will need to be replaced after 20 to 60 hours, depending on water filtration and operating pressure. The wrench flats provided on the Body & Nut should always be used when maintaining these tools. Table 2 details the wrench size required for each tool part. These wrenches are available from StoneAge.

Table 1- Tool Specifications

Part Number	Inlet Connection	Max Presure	Pressure Range (psi)	Flow Range
BT12-P1-B	1/16 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	5-6.5 gpm
BT12-M7-B	M7-1.0	22kpsi / 1500 bar	15,000 - 22,000 psi	6.5-8.5 gpm
BT12-MP4L-B	1/4-28 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	6.5-8.5 gpm
BT12-MP4R-B	1/4-28 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	6.5-8.5 gpm
BT18-P1-A	1/16 NPT	15kpsi / 1035 bar	8,000 -15,000 psi	7-9 gpm
BT18-P2-A	1/8 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	7-9 gpm
BT18-BSPP2-A	1/8 BSPP	18kpsi / 1250 bar	10,000 - 18,000 psi	8-10 gpm
BT18-MP4L-A	1/4-28 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	9-11 gpm
BT18-MP4R-A	1/4-28 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	9-11 gpm
BT18-MP6L-A	3/8-24 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	9-11 gpm
BT18-MP6R-A	3/8-24 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	9-11 gpm
BT25-P2-A	1/8 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	12-16 gpm
BT25-P4-C	1/4 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	12-16 gpm
BT25-BSPP4-A	1/4 BSPP	20.3kpsi / 1400 bar	15,000 - 20,300 psi	16-20 gpm
BT25-MP6L-A	3/8-24 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	16-20 gpm
BT25-MP6R-A	3/8-24 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	16-20 gpm
BT25-MP9L-A	9/16-18 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	16-20 gpm
BT25-MP9R-A	9/16-18 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	16-20 gpm
BT25-P2-C	1/8 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	8-11 gpm
BT25-P4-C	1/4 NPT	15kpsi / 1035 bar	8,000 - 15,000 psi	8-11 gpm
BT25-BSPP4-C	1/4 BSPP	20.3kpsi / 1400 bar	15,000 - 20,300 psi	11-13 gpm
BT25-MP6L-C	3/8-24 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	11-13 gpm
BT25-MP6R-C	3/8-24 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	11-13 gpm
BT25-MP9L-C	9/16-18 Left Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	11-13 gpm
BT25-MP9R-C	9/16-18 Right Hand	22kpsi / 1500 bar	15,000 - 22,000 psi	11-13 gpm

Caution! Never use Pipe Wrenches or Pliers to install or maintain the Banshee. After each use, always blow water out of the tool and fill with light oil such as WD-40.

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Safe Practices for Operation and Maintenance of Banshee® Tools

This information is critical to ensure safe operation of the tool and to achieve maximum tool operational life. Tool life can vary based on the type and frequency of cleaning operations, but improper maintenance can significantly degrade the usable life of a tool. Most Banshee tool issues occurring within the expected reliable lifetime of the Banshee result from users not adhering to the following recommended procedures.

Attention! Use the Right Tool for the Job

Use a correctly sized open end wrench to fit flats provided on the Inlet Nut when attaching tool to hose. Do not use Pipe Wrench or Pliers with teeth as this can crush and/or crack the hardened steel body, leading to tool breakage in operation. Recommended torque ranges and proper wrench sizes for tightening the Inlet Nuts to Banshee Bodies are shown in Table 2. All standard open end wrenches are available from StoneAge. Preset torque wrenches for Head installation are also available from StoneAge.

Pressure Dump

The pressure dump mechanism is the most important safety device when flex lancing. The operator nearest the nozzle should have control of the dump valve. If using multiple operators, each must have his own dump valve.

Hose

The high pressure hose should be as large as possible to minimize the pressure loss through the hose. Hose should be inspected for excessive wear or damage prior to use. The high pressure hose and end fitting should be no larger than the tool to be used on the end of it. There is an increased risk of hydraulic-ing when cleaning plugged tubes, when using larger ends.

Stinger

A stinger is a rigid piece of pipe or tubing used between the end of the hose and the nozzle. It is typically 2 feet in length and is primarily a safety device for hand flex lancing. When using stingers, the operator should be trained not to use it as a pry-bar or to bang on the deposit, particularly with rotating tube nozzles. They may break or stop rotating while being forced against the deposit. The coupling connecting the hose to the stinger should be of the slim-line type and no larger in diameter than the nozzle body; a larger coupling diameter increases the chances of material catching on the coupling and causing hydraulic-ing to occur.

Anti-Withdrawal Device

An anti-withdrawal device should be used when flex lancing. These devices provide a mechanical stop to prevent the waterjet tool from exiting the tube and injuring the operator during cleaning operations.

Operation

We recommend that the entire system be flushed out before installing the Banshee on the end of the hose or stinger. The swivels require a clean water supply for reliable operation; filtration to 25 micron particulates or smaller is recommended. Once the system is flushed, attach the Banshee and place it in an open tube while the operating pressure is being set. When the tool is at operating pressure, the water exiting the tool through the leak paths will keep external debris from entering the tool. If the tool is not under pressure, it should not be left inside a plugged tube. Doing so could allow debris to enter and prevent rotation or cause damage to the tool. If the tool does not rotate when the dump valve is closed, the operator should try closing the dump valve slowly a few times to build up pressure slowly until normal operation is achieved. This also flushes debris out of the tool.

The drilled nozzle head/shaft will last between 20 and 60 hours. Worn jets decrease the cutting rate. The tool may begin to hydraulic when cleaning plugged tubes. This occurs if the jets are not effectively cutting the material into smaller pieces. When using rotating nozzles in plugged tubes, do not jam the head into the deposit because this will stop the rotation of the tool and impede the cutting ability. When the tool contacts the deposit, allow it to cut away the material and advance at its own rate. If it stops advancing, pull back slightly on the hose to move the head away from the deposit. This action also allows the jets to cut the deposit at different angles. The hose should be gradually fed into and out of the tube, allowing time for the jets to do their work. Repeat this process until the tube is unplugged.

When polishing tubes with scale, the tool has been observed passing through a 50 foot long scaled tube in 10 seconds. While this is sufficient when cleaning easy-to-remove deposits, we recommend feeding the tool through the tube at a slower rate. This will ensure adequate cleaning. Unless the deposit is very easy to remove, this will not completely remove the scale.

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Attention! Clean and Store the Tool Properly

Between jobs, the swivel should be blown out and filled with light oil. StoneAge recommends WD-40 to prevent corrosion pitting. Pitting can cause premature tool failure due to cracking. Corrosion pitting is one of the most common failures for a Banshee Beetle. Proper storage in WD-40 can significantly lengthen tool life.

Maintenance

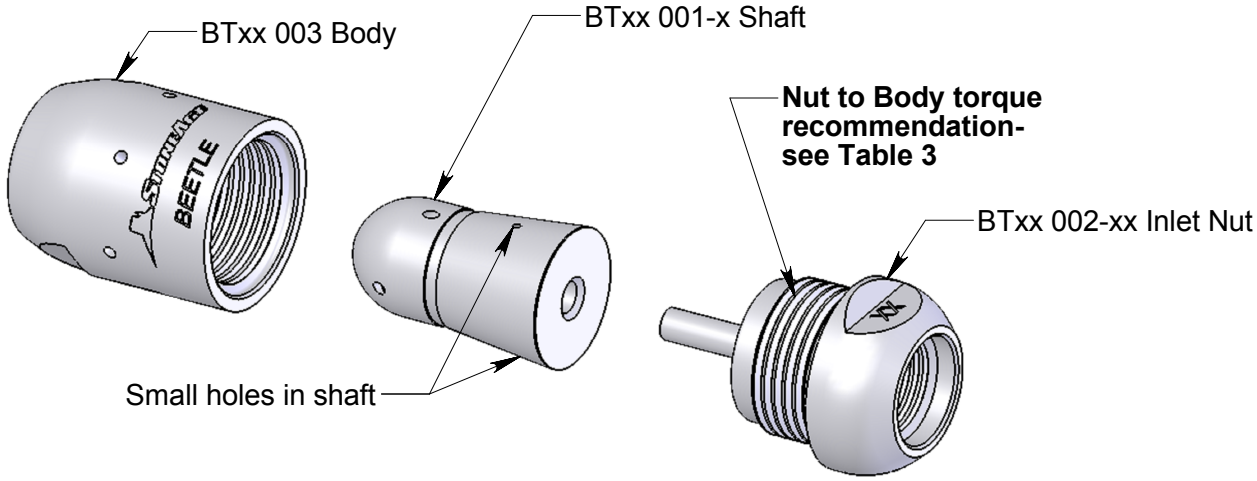
All sizes of the Banshee tool line have a tapered shaft that fits into a tapered body. Under operating conditions these surfaces do not touch. Do not pull out on the head/shaft in order to rotate the tool, it will lock up. If this happens, tap the head/shaft on a surface to knock it free.

Check the nozzle orifices in the head/shaft for plugging; if one becomes plugged the swivel will likely not rotate. If this does not solve the problem, the swivel should be disassembled and inspected. There are two small holes exiting the tapered portion of the shaft; these should be checked for debris and cleaned out. Blow out the body and wipe off the shaft to remove any debris.

Refer to Table 3 for recommended assembly torque ranges and proper wrench sizes.

Table 2- Recommended Torque Ranges and Required Wrench Sizes

	PART	WRENCH SIZE (in)	RECOMMENDED TORQUE RANGES (with anti-seize)					
			in-lbs		ft-lbs		N-m	
BT12	Body	7/16	156	180	13	15	17.6	20.3
	Nut	7/16						
BT18	Body	5/8	270	300	23	25	30.5	33.9
	Nut	9/16						
BT25	Body	15/16	420	460	35	38	47.5	52.0
	Nut	11/16						



***BTxx is used to denote the BT12 or BT18 tools**

Warning! Use a correctly sized open end wrench to fit flats provided on the Inlet Nut when attaching tool to hose. Do not use Pipe Wrench or Pliers with teeth as this can crush and/or crack the hardened steel body, leading to tool breakage in operation.

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