

General



1. Only trained persons should use this equipment.
2. The work area should be marked off to keep out untrained persons.
3. All personnel in the area should wear appropriate Personal Protective Equipment, including eye and hearing protection as well as other protective clothing, in accordance with specific conditions.
4. Inspect equipment for visible signs of deterioration, damage, or improper assembly. Do not operate until repaired.
5. Flush hoses and lines before installing nozzles to avoid plugged orifices.
6. Ensure all threaded connections are tight and leak free. Use an anti-galling lubricant on stainless steel threads. Use both Teflon tape and an anti-gall lubricant on pipe threads.
7. Check all nozzle orifices before use. If any are plugged, they must be cleaned or replaced.
8. Equipment should always be used with an operator controlled dump mechanism to quickly release the high pressure water.
9. Strong thrust is created by waterjets and these forces can become unbalanced if a nozzle should plug. Properly support equipment to withstand these forces.
10. Check that all control functions work properly before using high pressure.
11. On initial startup, increase pressure slowly to ensure proper functioning, balance and positioning of tool.
12. Use fittings that are marked with pressure ratings. Do not exceed the maximum operating pressure specified for any component in the system.



Tube Cleaning Systems

Rigid Lancing

1. The far end of the bundle being cleaned should be marked off and a shield used if personnel are or will be nearby.
2. When performing rigid lancing, the person nearest the jets should have control of the pressure dump.
3. The lancing machine should be securely supported to handle both the jet reaction force and possible hydraulic-icing.

4. The operator should be positioned where he can see the tube face, but far enough away to reduce getting splash back from the cleaning operation.
5. Mechanical stops should be set to avoid feeding the lance much beyond the tube end.
6. The operator should be aware of the operating window in the positioner to avoid damage to hoses or equipment as the carriage passes through.

Surface Preparation

1. Shielding should be used to capture jet rebound and flying material.
2. Be aware of jet thrust limitations of the equipment based on weight or strength; additional weight may need to be added to handle high flow rates.



Floor & Deck Cleaners

Vessels & Tanks

1. If it is necessary to have someone working near the cleaning jets, this person should have control of the pressure dump.
2. High flow rates can produce hundreds of pounds of jet thrust. Make certain that your equipment is capable of securely supporting the jet thrust.
3. Beware of falling or flying material; stay away from vessel openings while in process. 3-D tools have jets that may cross an opening unpredictably.
4. Rotating cleaning equipment with long nozzle arms should be started and stopped slowly to prevent unscrewing of connections due to inertia.
5. Waterjets can produce a static electrical charge. If the vessel being cleaned contains a combustible liquid or vapor having a risk of ignition, the tool should be properly grounded.



40k psi Pressure (2800 bar)



BJ 305™ backout preventer in use

Rotary Shotgun Nozzles

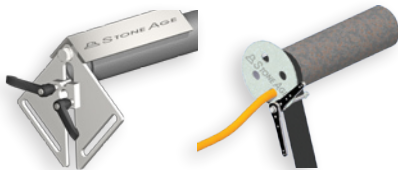
1. Use a jetting gun with a barrel length sufficient to ensure that the tool contacts the ground before passing over the operator's foot.
2. Jetting gun must have a pressure dump device controlled by the operator.
3. Jet reaction force should not exceed 2/3 the weight of the operator in good conditions.
4. In poor conditions (uneven or slippery footing, low light, confined spaces, etc.) use a lower jet reaction force.
5. Use equal jet sizes in opposite nozzle head ports to prevent vibration from jet imbalance.



Jet reaction force can be very powerful

Pipe & Tube Cleaning

1. Equipment should always be used with an operator controlled dump mechanism to release the high pressure water. The person working nearest the cleaning jets should have control of the pressure dump.
2. The length of the tool including end fitting on hose should be equal to or greater than the inside diameter of the pipe to be cleaned to prevent the tool from turning around. If not, a rigid pipe or nipple should be installed between the hose end and tool.
3. Use rigid pipe or colored leader hose connected to the tool as an indicator of tool approaching the operator.
4. Strong thrust is created by waterjets and these forces can become unbalanced if a nozzle plugs during operation.



Sample of Backout Preventers We Stock

5. Use of a backout preventer is recommended to stop tools from backing out of a pipe. A guard should be used if there is risk of the tool turning around in the pipe.

6. When cleaning small diameter plugged tubes, use a tool and hose diameter less than 2/3 of the tube diameter to allow room for debris to escape. A waterjet resistant guard is recommended to protect the operator if the tool is pulled or forced back out of the tube.
7. Avoid having the operator and/or personnel standing in the possible path of an out of control tool.
8. Waterjets of sufficient pressure can damage pipes and tubes if they are not kept moving.

IMPORTANT NOTE ABOUT WRENCHES

Use a correctly sized open-end wrench to fit the flats provided on the inlet nut when attaching the tool to the lance. Do not use a pipe wrench or pliers with teeth as this can crush and crack the hardened steel body, leading to tool breakage during operation.

Sewers & Culverts

1. A protective sleeve should be used. The retaining clamp and rope should be attached to the end of the sleeve nearest the truck. (Note photo below.)
2. Never operate tools in a pipe or opening of a large enough diameter that would allow the tool to turn around unless a secure shield is used. These tools must be specifically jetted for manhole cleaning.
3. The length of the tool including the end fitting on hose should be equal to or greater than the inside diameter of the pipe to be cleaned to prevent the tool from turning around. If not, a rigid pipe should be installed between the hose end and the tool.
4. Position the tool two feet or more into the line before increasing pressure. After the tool is positioned in the line, tape a flag or marker to the reel hose two to three feet above manhole grade. There should be only one marker on the hose. Do not rely solely on the reel counter to determine length of hose remaining in line.
5. Avoid having operator and/or personnel standing in possible path of an out of control tool.
6. Turn off and secure pump before removing the tool from the line.
7. Secure both the hose reel and tool to prevent tool from dragging on the ground while driving.



Protective sleeve in use