StoneAge® Rotary Hydro-Excavation Tool (HXR-300)

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

Description:

The HXR-300 Rotary Hydro-Excavation Tool is designed to safely unearth or daylight underground utilities. The rotary motion decreases the dwell time of the fluid nozzle thereby eliminating the potential hazards of excavating buried utilities such as gas, electric, water, etc. The HXR-300 Tool has a unique and efficient driving mechanism that improves jet quality while increasing startup and rotation consistency. The nozzle and seat are made of durable Tungsten Carbide for a long running life and are easily replaceable. The HXR-300 also features a replaceable shield cap to protect the head and a 1/2" female NPT inlet port and can be connected to a 1/2" pipe lance. The tool can be operated at pressures up to 5,000 psi (350 bar) and flows up to 10 gpm.

Operation:

The HXR-300 should always be used with a system that includes a dump or pressure shut off mechanism so that pressure can be rapidly released for safety. The total length of the HXR-300 Tool and lance assembly should be long enough to prevent the Operator from passing the jet over their feet or legs. It is recommended that the thrust produced by the jet be no more than 1/3 of the Operator's body weight. Always flush the high pressure hose before connecting to the HXR-300 Tool to avoid debris getting into the tool when connecting it to the lance. Test the dump mechanism functions prior to operating the system with high pressure water. To set the operating pressure, the Gun Operator should close the dump on the gun and the Pump Operator should slowly increase the pressure to allow the Gun Operator to compensate for the jet thrust. Once operating pressure is reached, the HXR-300 Tool can be run for normal hydro-excavation purposes.

After using the HXR-300 Tool, blow out any remaining water with compressed air if available or rinse the tool out with fresh, low pressure, water to remove any debris. Failure to follow this proceedure may cause the tool not to function properly with subsequent use.

Suggested Use:

- The HXR-300 Tool can be used in regions or work environments that require rotary hydro-excavation.
- The HXR-300 Tool can be used whenever an Operator is working around or daylighting underground utilities.
- The HXR-300 Tool can also be used in normal daily operation including post holing, trenching, or washing down large surfaces such as concrete or metal.

Trouble Shooting:

Tool Not Rotating: Follow the steps below if the HXR-300 Tool is not rotating or is having trouble starting rotation.

- Remove the tool from the lance and disassemble (see page 2 for disassembly instructions).
- Inspect the inside of the tool for debris and clean if necessary.
- Remove the Nozzle (HXR 315-X) and the Nozzle Seat (HXR 312) and inspect for excessive wear or damage.
- Make sure the nozzle is not plugged with debris as well. If it is, carefully use a small pin to remove debris.
- If damage or wear is present, replace the Nozzle and Nozzle Seat. See page 2 for assembly instructions.

Tool Jetting:

The HXR-300 Tool is available in three jet sizes; #5, #8 and #10 nozzle. See the below chart for the flow of each of these nozzles sizes at different operating pressures.

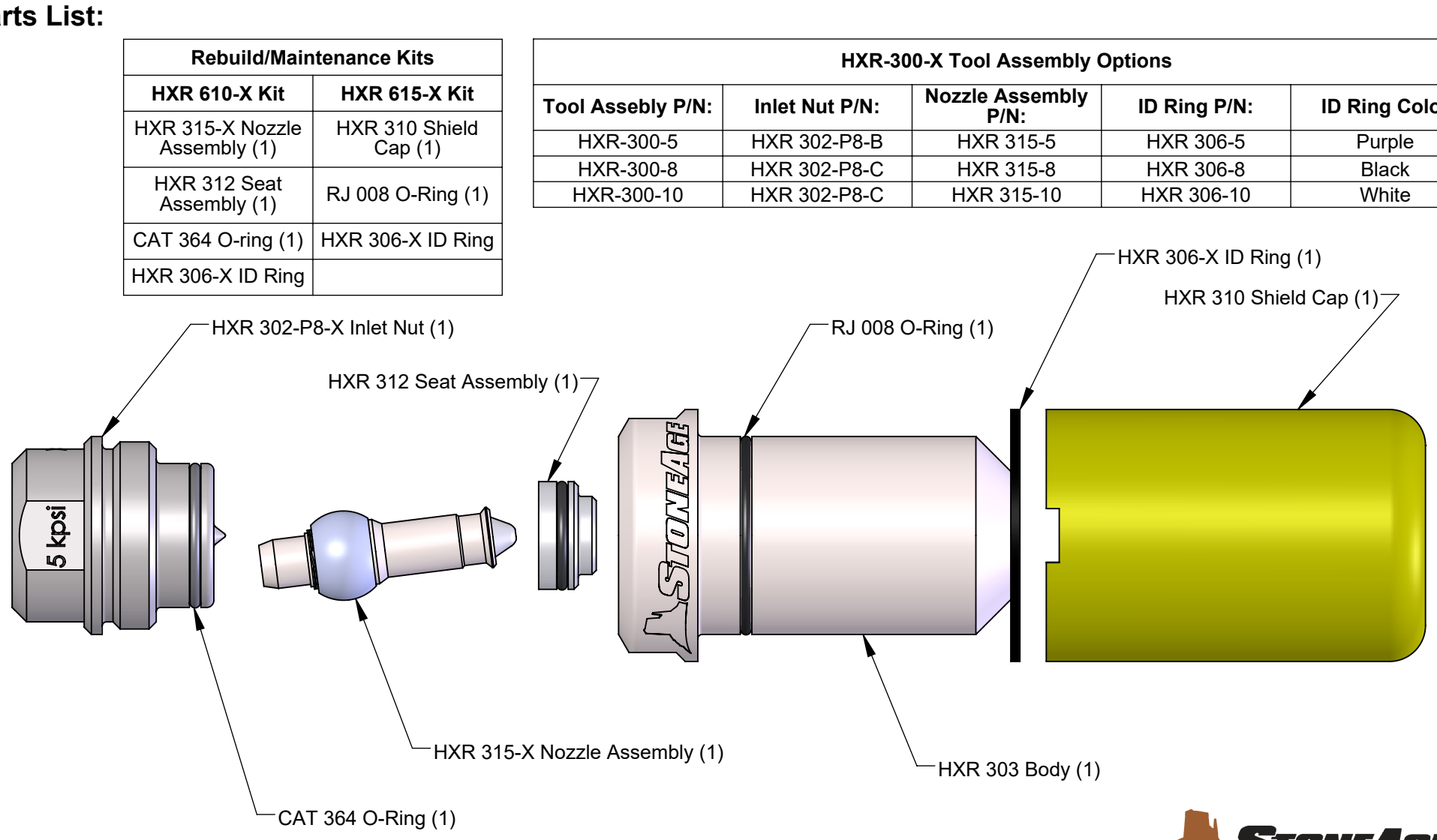
Nozzle	Orifice Ø inches	1,500 psi	2,000 psi	2,500 psi	3,000 psi	3,500 psi
#5	.057	3.4 gpm	3.9 gpm	4.3 gpm	4.8 gpm	5.1 gpm
#8	.072	5.3 gpm	6.1 gpm	6.8 gpm	7.5 gpm	8.1 gpm
#10	.080	6.5 gpm	7.5 gpm	8.4 gpm	9.2 gpm	9.9 gpm

Nozzle	Max Thrust (3,500 psi)
#5	15.6 lbs
#8	24.3 lbs
#10	29.4 lbs

Parts List:

Rebuild/Maintenance Kits	
HXR 610-X Kit	**HXR 615-X Kit**
HXR 315-X Nozzle Assembly (1)	HXR 310 Shield Cap (1)
HXR 312 Seat Assembly (1)	RJ 008 O-Ring (1)
CAT 364 O-ring (1)	HXR 306-X ID Ring
HXR 306-X ID Ring	

HXR-300-X Tool Assembly Options				
Tool Assebly P/N:	**Inlet Nut P/N:**	**Nozzle Assembly P/N:**	**ID Ring P/N:**	**ID Ring Color**
HXR-300-5	HXR 302-P8-B	HXR 315-5	HXR 306-5	Purple
HXR-300-8	HXR 302-P8-C	HXR 315-8	HXR 306-8	Black
HXR-300-10	HXR 302-P8-C	HXR 315-10	HXR 306-10	White



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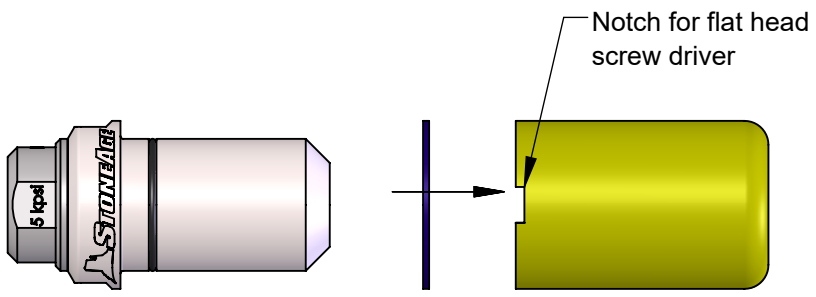
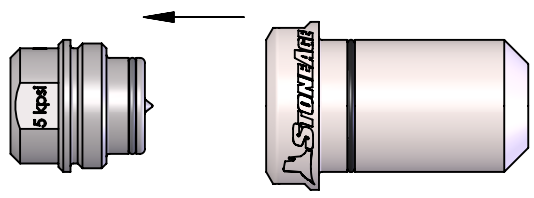
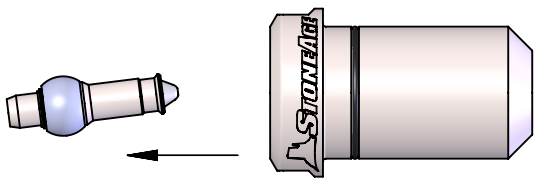
DISASSEMBLY:



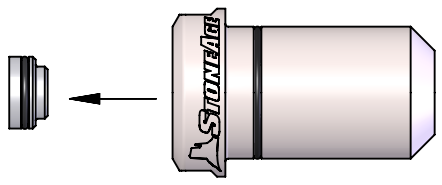
Step 1: Once the Tool is disconnected from the lance, remove the Shield Cap (HXR 310) and the ID Ring (HXR 306-X) from the tool. Use flat head screw driver in notches for assistance if needed.



Step 2: Once the Shield cap is removed, unthread the Inlet Nut (HXR 302-P8-X) from the Body (HXR 303).

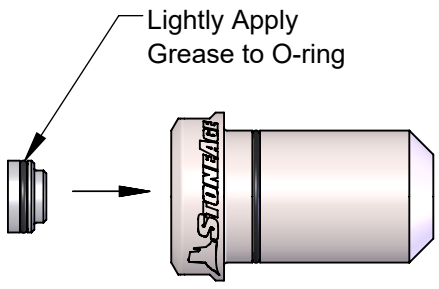


Step 3: Remove the Nozzle Assembly (HXR 315-X) from inside the Body (HXR 303).

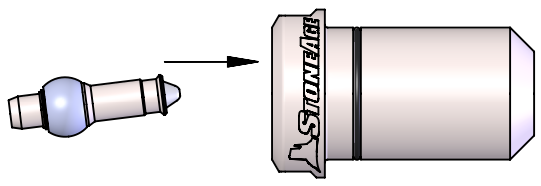


Step 4: Press on the front of the tool to remove the Seat Assembly (HXR 312) from the Body (HXR 303). Use punch a press if necessary.

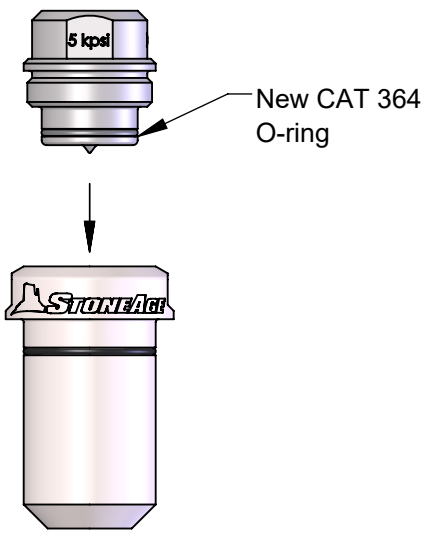
ASSEMBLY:



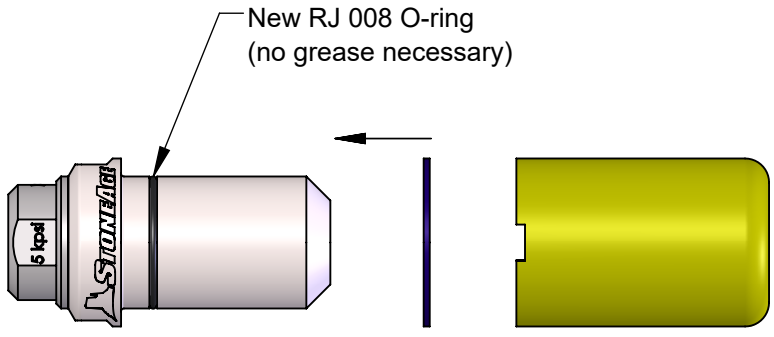
Step 1: Install new Seat Assembly (HXR 312) into the Body (HXR 303). Apply light grease to the O-ring on the Seat Assembly to aid in assembly. Make sure Seat Assembly is fully seated into the body, use a press if necessary.



Step 2: Install new Nozzle Assembly (HXR 315-X) into the Body (HXR 303). Make sure the tip of the Nozzle makes full contact with the seat.



Step 3: With Tool in a vertical position (as shown above) thread the Inlet Nut (HXR 302-P8-X) back into the Body (HXR 303). Ensure that a new O-ring (CAT 364) is installed on the Inlet Nut. Firmly Tighten Inlet Nut into the Body with wrench. Vertical Position keeps the Nozzle Assembly (HXR 315-X) in the Tool during installation of the Inlet Nut.



Step 4: With a new O-ring (RJ 008) on the Tool, install a new ID Ring (HXR 306-X) and Shield Cap (HXR 310) on the tool. Make sure the Shield Cap snaps over the O-ring and is secured on the Tool.

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