

RAPTOR

SELF ROTARY SWIVELS (RPT-P8, RPT-MP9, RPT-M24)

USER MANUAL



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This manual must be used in accordance with all applicable national laws. The manual shall be regarded as a part of the machine and shall be kept for reference until the final dismantling of the machine, as defined by applicable national law(s). Updated manuals can be downloaded at:

<https://www.stoneagetools.com/manuals>

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Raptor Model Specifications		
Model	RPT-P8	RPT-MP9/RPT-M24
Pressure Range	2–15k psi (140–1000 bar)	2–22k psi (140–1500 bar)
Flow Range	10–60 gpm (38–227 l/min)	10–60 gpm (38–227 l/min)
Flow Coefficient	2.3 Cv	2.3 Cv
Rotation Speed	15-60 rpm (Slow Fluid) 50-250 rpm (Fast Fluid)	15-60 rpm (Slow Fluid) 50-250 rpm (Fast Fluid)
Inlet Connection	1/2 NPT	9/16 MP, M24
Port Size	1/8 NPT (P2), 1/4 NPT (P4)	1/8 NPT (P2), 1/4 NPT (P4)
Extension Port Size	1/4 NPT (P4)	1/4 NPT (P4)
Nozzle Type	AP2, AP4, APF4	AP2, AP4, APF4
Plug	GP 025-P2SS	GP 025-P2SS
Extension Plug	GP 025-P4SS	GP 025-P4SS
Swivel Diameter	2 in. (51 mm)	2 in. (51 mm)
Swivel Length	9.5 in. (240 mm)	9.5 in. (240 mm)
Swivel Weight	4.2 lb (1.9 kg)	4.2 lb (1.9 kg)
Head Diameter	2.0-2.5in (51-64mm)	2.0-2.5in (51-64mm)
Head Weight	1.1–2.4 lb (0.5–1.1 kg)	1.1–2.4 lb (0.5–1.1 kg)
Maximum Water Temperature	160 °F (70 °C)	160 °F (70 °C)

DESCRIPTION OF EQUIPMENT AND INTENDED USE

The Raptor self-rotating pipe cleaning tool is ideal for cleaning process drains, totes, closed head drums, water well screens, ducts and exhaust stacks.

The Raptor handles flows up to 60 gpm to cut through heavy deposits in pipes as small as 2.25 inches (57 mm) in diameter. Combined with a centralizer, it cleans pipes as large as 12 inches (305 mm).

FEATURES

- Wide operating range- Better match your pump capacity for more versatile cleaning capabilities of heavy to light deposits with one tool.
- Multiple head options- Same tool pairs with multiple heads, saving the cost of a purchasing a second specialized tool.
- Pulling ring option available- Clean vertical or extra long horizontal lines, a feature not widely available on similar tools.
- Two speed ranges- Maximize cleaning by choosing slower speeds for hard to clean or plugged pipes, and faster speeds for polishing easy to clean pipes with a single tool.
- Jetting options to match the work required- Same tool can be re-jetted to match a variety of cleaning applications — great for when you need more pulling force vs. forward hitting power.

WARNING AND SAFETY INSTRUCTIONS

⚠ WARNING

Raptor Models can turn around in large pipes and come back at the operator at a high rate of speed. If cleaning larger pipes, a rigid “stinger” should be used between the hose and the tool. It is recommended that the rigid length of the tool including hose end is 1-1/2 times the inside diameter of the pipe being cleaned (see below).

Make sure there is an operator controlled dump in the system, operated by the person closest to the cleaning job. Flush out the high pressure hoses before connecting the Raptor. It is recommended that the hose be marked a few feet from the end with a piece of tape so the operator knows when to stop when retracting the tool. Position the tool in the pipe opening. Close the dump and slowly bring up to pressure the first time to make sure no nozzles are plugged and the jet thrust is correct. The Raptor should begin to slowly rotate. Once operating pressure is reached, feed the tool into the pipe to begin the cleaning job. Allow the jets time to do their work by feeding the hose out at a controlled rate. The StoneAge ABX-500 Hose Control Device can be used to achieve consistent feed rates for pipe cleaning. When the work is complete and the tool is disconnected from the hose, blow out all water to prolong the life of the tool. A small amount of oil can be blown into the tool as well as an added measure to maximize tool life.

It is strongly recommended to use a backout prevention device. Please see the “Accessories” section of this manual for a list of backout preventers available through StoneAge Tools.

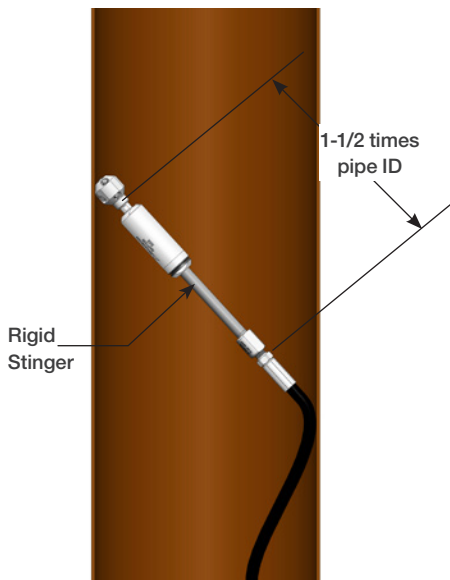
⚠ DANGER

Operations with this equipment can be potentially hazardous. Caution must be exercised prior to and during machine and water jet tool use. Please read and follow all of these instructions, in addition to the guidelines in the WJTA Recommended Practices handbook, available online at www.wjta.org.

Deviating from safety instructions and recommended practices can lead to severe injury and/or death.

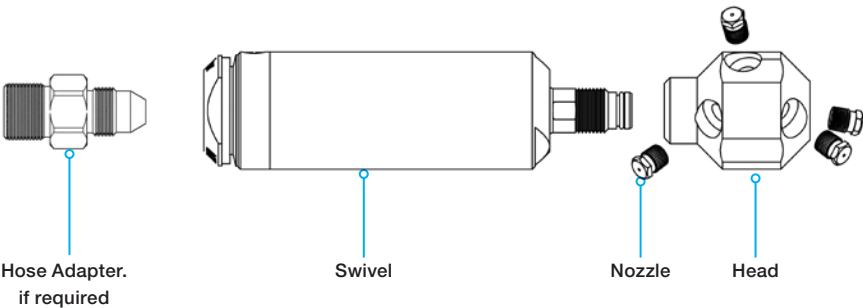


IMPROPER USE:
Raptor will turn around in large diameter pipe
VERY DANGEROUS!



PROPER USE:
Raptor with rigid “stinger” to prevent turnaround.

RAPTOR TOOL CONFIGURATION



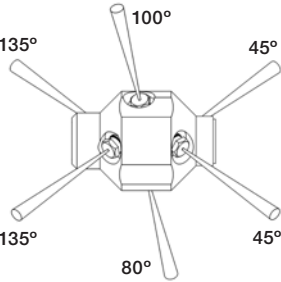
SWIVEL SELECTION

There are six Raptor swivel options available. The correct swivel is selected based on the maximum working pressure, inlet connection and required rotation speed.

Maximum Pressure	Inlet Connection	Swivel Part ID Based on Rotation Speed	
		SLOW (15-60 rpm)	FAST (50-250 rpm)
15k psi 1000 bar	1/2 NPT Female	RPT-P8-S	RPT-P8-F
22k psi 1500 bar	M24 Female	RPT-M24-S	RPT-M24-F
	9/16 MP Female	RPT-MP9-S	RPT-MP9-F

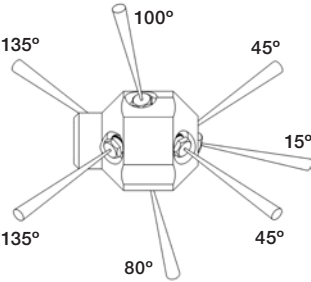
HEAD SELECTION

There are two standard head configurations for Raptor tools. Custom heads are available on request. The correct head specification is based on the pressure and flow of the pump and the required port size. The following table lists head selection approximations of common jetting scenarios.



6-PORT

2 @ 45°, 1 @ 80°, 1 @ 100°,
2 @ 135°



7-PORT

1 @ 15°, 2 @ 45°, 1 @ 80°, 1 @ 100°,
2 @ 135°

See the next page for Head and Swivel combinations based on common pressures and flows.

NOZZLE AND PLUG LOCATIONS

RAPTOR TOOL CONFIGURATIONS CONTINUED

PLEASE NOTE: The following table lists head selection approximations of common jetting scenarios for Raptor swivels:

Pressure	Flow	Head Type		
		6 X P2 PORTS 2" Ø	7 X P2 PORTS 2" Ø	6 X P4 PORTS 2.5" Ø
5k psi 350 bar	10–23 gpm 38–87 l/min	RPT 043-P2-6-R30	RPT 043-P2-7-R30	RPT 044-P4-6-R30
	16–38 gpm 60–140 l/min	RPT 043-P2-6-R18	RPT 043-P2-7-R18	RPT 044-P4-6-R18
	25–60 gpm 95–230 l/min	RPT 043-P2-6-R11	RPT 043-P2-7-R11	RPT 044-P4-6-R11
10k psi 700 bar	10–18 gpm 38–68 l/min	RPT 043-P2-6-R30	RPT 043-P2-7-R30	RPT 044-P4-6-R30
	15–31 gpm 57–120 l/min	RPT 043-P2-6-R18	RPT 043-P2-7-R18	RPT 044-P4-6-R18
	25–51 gpm 95–190 l/min	RPT 043-P2-6-R11	RPT 043-P2-7-R11	RPT 044-P4-6-R11
15k psi 1000 bar	10–17 gpm 38–64 l/min	RPT 043-P2-6-R30	RPT 043-P2-7-R30	RPT 044-P4-6-R30
	16–28 gpm 60–110 l/min	RPT 043-P2-6-R18	RPT 043-P2-7-R18	RPT 044-P4-6-R18
	26–47 gpm 98–180 l/min	RPT 043-P2-6-R11	RPT 043-P2-7-R11	RPT 044-P4-6-R11
22k psi 1500 bar	10–16 gpm 38–60 l/min	RPT 043-P2-6-R30	RPT 043-P2-7-R30	RPT 044-P4-6-R30
	17–26 gpm 64–100 l/min	RPT 043-P2-6-R18	RPT 043-P2-7-R18	RPT 044-P4-6-R18
	27–43 gpm 100–160 l/min	RPT 043-P2-6-R11	RPT 043-P2-7-R11	RPT 044-P4-6-R11

NOZZLES AND PLUG LOCATIONS

Raptor tool heads can be configured differently depending on the application. The thrust of the jets can be used to pull the tool through a pipe. Little or no pull is needed for cleaning vertically downward, but more pull is needed if cleaning horizontally or climbing upward.

The table below shows suitable nozzle/plug configurations for the Raptor tools.

Head Style	45° Port	80° Port	100° Port	135° Ports
6 Port	2 x Nozzle	1 x Nozzle	1 x Nozzle	2 x Nozzle
	2 x Plug	1 x Nozzle	1 x Nozzle	2 x Nozzle
	2 x Plug	1 x Nozzle	1 x Nozzle	2 x Plug
	2 x Plug	1 x Plug	1 x Plug	2 x Nozzle

Head Style	15° Port	45° Port	80° Port	100° Port	135° Ports
7 Port	1 x Nozzle	2 x Nozzle	1 x Nozzle	1 x Nozzle	2 x Nozzle
	1 x Nozzle	2 x Plug	1 x Nozzle	1 x Nozzle	2 x Nozzle
	1 x Nozzle	2 x Nozzle	1 x Plug	1 x Plug	2 x Nozzle
	1 x Nozzle	2 x Plug	1 x Plug	1 x Plug	2 x Nozzle

The nozzle sizes should be selected based on proportioning the total flow rate between the forward and backward jets to achieve the pulling force needed, but still applying enough power to the material being removed ahead of the tool. Use the StoneAge Jetting App to determine the nozzle sizes:

<http://jetting.stoneagetools.com>

OPERATION:

- Make sure there is an operator controlled dump in the system, operated by the person closest to the cleaning job.
- Flush out the high pressure hoses before connecting Raptor to hose end or stinger to eliminate debris.
- When cleaning a pipe, it is recommended that the hose be marked a few feet from the end with a piece of tape so the operator knows when to stop on the way back out.
- When cleaning a pipe, a stinger is recommended; 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. This is illustrated on the "Warning and Safety Instructions" page of this manual.
- Position the Raptor in a tube or the pipe while the pressure is being set. The high pressure seal may leak initially; it should stop when pressure is increased and rotation begins.
- Close the dump and slowly bring up to pressure the first time, to make sure no nozzles are plugged and that the jet thrust is correct. The swivel should begin to slowly rotate.
- Once operating pressure is reached, feed the tool into the tube or pipe to begin the cleaning job.
- When using rotating heads in plugged tubes, the Raptor must not be forced into the deposit, as this may stop the rotation of the tool and impede the cutting ability. When the Raptor contacts the deposit, allow it to cut away the material and advance at it's own rate. If it stops advancing, pull back slightly on the hose to pull the head slightly away from the deposit, in case it is being stopped from rotating by the deposit. This also allows the angled jets to attack the deposit at different places.
- When polishing tubes with scale, it is possible to allow the tool to pass through the tube at very fast rates; unless the deposit is very easy to remove, this will not completely remove the scale.
- The operator needs to be trained to feed the Raptor through the tube at a rate sufficient to clean the tube.
- Once the work is complete and the Raptor is disconnected from the hose, blow out all water to prolong the life of the tool. A small amount of oil can be blown into the inlet nut as well.

TROUBLESHOOTING

HIGH-PRESSURE WATER SEALS LEAK:

- The high pressure seal may leak initially at lower pressures, but should pop closed as pressure is increased. A continuous leak at operating pressure from the weep holes indicates the need to replace the HP Seal and Seat. HP Seals wearing out too quickly can be an indication that the shaft bore is worn, the HP Seat in the seal assembly is installed upside-down, or the tool is over spinning. Over spinning is caused by low or contaminated viscous fluid, water in the fluid chamber (replace shaft seals), or too much jet torque. Refilling the viscous fluid every 40-80 hours of operation is important for proper speed control. Only use StoneAge recommended viscous fluid.

SEALS WEAR OUT TOO QUICKLY:

- The tool must be disassembled and inspected. The carbide seat should be checked for being installed in the right direction, and it should not have any chips or erosion marks on it. The bore of the shaft where the high pressure seal is located should be checked for grooving. If it is worn larger than .508", the shaft will need to be replaced.

HEAD WILL NOT ROTATE:

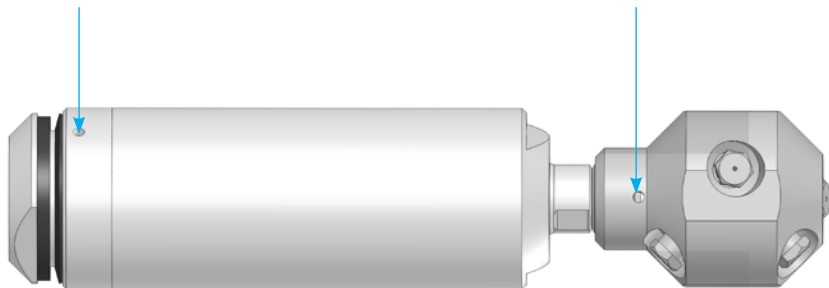
- First try rotating head by hand and see if it feels rough or gritty to turn. If it does, the tool must be disassembled and repaired. If the head starts to rotate but as pressure is increased it slows down and stops, it likely has bad bearings. If the tool feels okay, check to see if any nozzles are plugged; even if a nozzle is only partially blocked it can keep the head from rotating. Nozzles must be removed from the head to properly clean them; it does not do any good to poke the material plugging the nozzle back into the head, as it will just replugin a nozzle. If none of these are the problem, the jets are too small or the head offset is not correct; refer to the above description about the head offset and double check the nozzle sizes to make sure they are correct for the expected flow rate.

HEAD SPINS TOO FAST:

- A significant increase in rotation speed means that the speed control mechanism in the tool has lost functionality. This can be a result of viscous fluid loss or fluid contamination. Operation of the tool in this state can cause damage to other components and accelerated wear of the high pressure seal. If this occurs, the first step is to flush the tool with new viscous fluid as shown in the "Lubricant Replacement" instructions in this manual.

LEAKAGE FROM HERE
INDICATES A WORN SEAL

LEAKAGE FROM HERE
INDICATES WORN O-RINGS



TOOL SERVICE

***Product training and proper tools are required to service this nozzle.

If you are uncomfortable performing the service, send in or bring the tool to your authorized dealer. StoneAge provides maintenance videos for the Raptor models online.

<https://www.youtube.com/watch?v=U2ABW4lcDkE>

The use of a bench vice and an arbor press is recommended. Take care throughout the entire procedure to keep the internals clean and free from grit, lint, and contamination. Failure to do so could result in premature failure after service.

LIST OF TOOLS:

- Bench Vice (recommended)
- Arbor Press (recommended)
- RPT 612 Kit Contains; RPT 105 Seal Press tool
- 18" Adjustable Wrench (such as Crescent® C718 Automatic Adjustable Pipe Wrench)
- Small size flat-head screw driver
- Medium size flat-head screw driver
- Pick
- Ball point pen
- 9/64" Hex Wrench
- Snap Ring Pliers

LIST OF MATERIALS:

- Clean lint free rags or blue shop towels
- BJ 048-F Viscous Fluid
- BJ 048-S Viscous Fluid will help slow the rotation of the Swivel if desired
- Anti-Seize - StoneAge Part Number GP 043 Blue Goop
- Lithium Soap Grease - StoneAge Part Number GP 048 Grease
- P-80® Grip-IT Lubricant

Blue Goop® is a registered trademark of the Swagelock® Corporation.

P-80® Grip-IT Lubricant is a registered trademark of the International Products Corporation.

LUBRICANT REPLACEMENT

LUBRICANT FILL INSTRUCTIONS

The most important item in maintaining this swivel is keeping the tool full of viscous fluid, which provides lubrication and speed control. The viscous fluid should be checked when the tool begins to run faster than usual, and during high pressure seal replacement. Clamp the flats of the Raptor body in a vice.

1. Remove the BJ 026 Port Plug from the Inlet Nut
2. With an adjustable end wrench, remove and retain the nut assembly. Remove and retain the High Pressure Seal and Carbide.
3. If the fluid appears contaminated, it should be drained and replaced
4. Refill with Viscous fluid to covering bearing.
5. Install the High Pressure Seal and Carbide Seat.
6. Install the Inlet Nut onto the body with an adjustable end wrench.
7. Install the Port Plug.

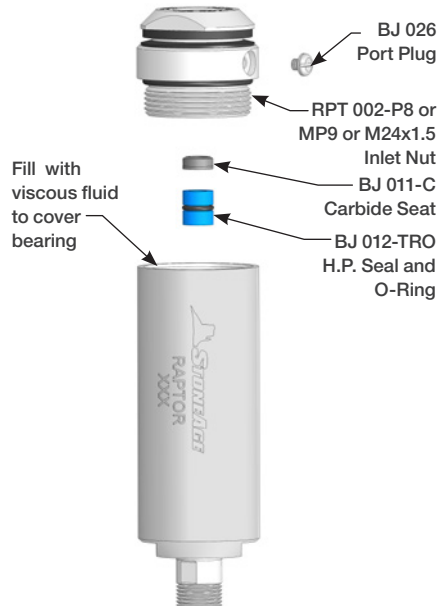


Figure 1: Lubricant Flush

HIGH PRESSURE SEAL REPLACEMENT

TO REPLACE THE HIGH PRESSURE SEAL:

1. Remove the Port Plug (BJ 026).
2. Unscrew the Inlet Nut (RPT 002-P8, MP9 or M24x1.5) from the Body.
3. Pull out the Seat (BJ 011-C) and H.P. Seal (BJ 012-TRO) from the bore of Shaft.
4. Inspect the bore of the Shaft; if it is badly grooved it should be replaced.
5. Inspect the face of the Inlet Nut where the Seat makes contact; if it is pitted or dented, it should be faced or replaced.
6. Check the viscous fluid level and condition; if the fluid appears badly contaminated it should be replaced. Otherwise add fluid to cover the Bearing.
7. Apply grease to a new H.P. Seal and install into bore of Shaft. Do not push it all the way in.
8. Place a new Seat (BJ 011-C) on top of H.P. Seal; the flat face of the Seat goes against the seal (see detail). Push it in just far enough so that it will stay in the bore.
9. Apply anti-seize to threads of Inlet Nut and thread into Body; make sure the Seat stays centered in bore of Shaft. Tighten to 50 ft-lb.
10. Install the Port Plug.

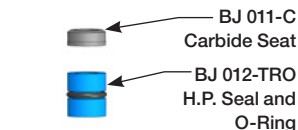
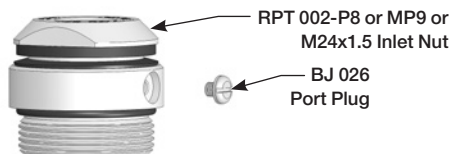


Figure 2:

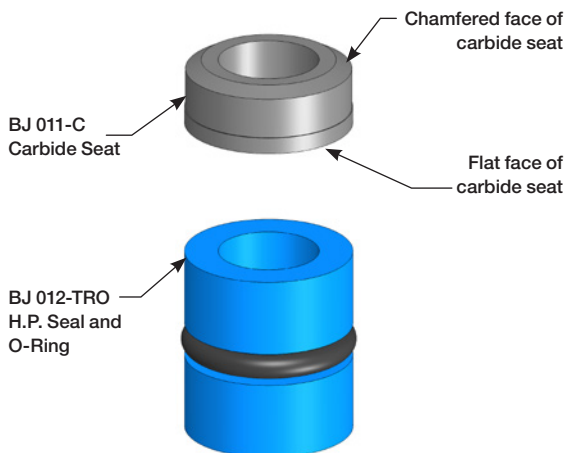


Figure 3: High Pressure Seal Subassembly

DISASSEMBLY

1. Locate the flats on the Head and tighten them in a vice, so that the Inlet Nut end of the Raptor is facing up.
2. Slide an adjustable wrench onto the Collar flats and loosen the Head from the Body.

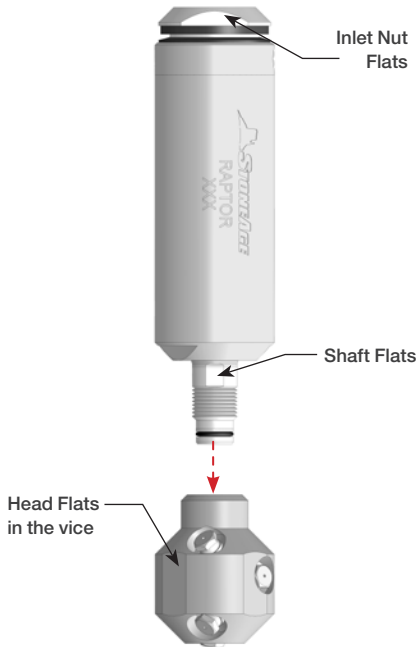


Figure 4: For Steps 1-2

3. Remove the Raptor from the vice, flip it over and using a pick, remove the MJ 016 O-Ring from the Shaft Assembly.
4. Remove the BC 031 Backup Ring.

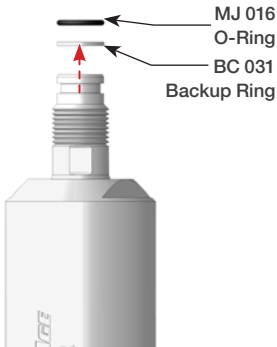


Figure 5: For Steps 3-5

5. Remove the BJ 021-S Weep Seal with a pick.
6. Remove the BJ 026 Port Plug with a small flat-head screw driver.

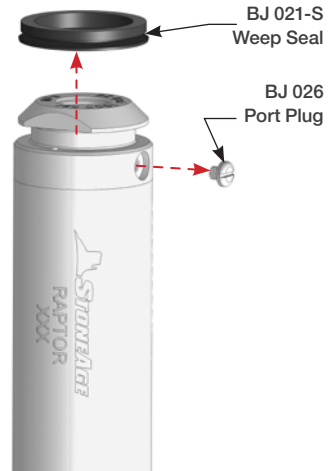


Figure 6: For Steps 6-7

7. With an adjustable end wrench remove the Inlet Nut.

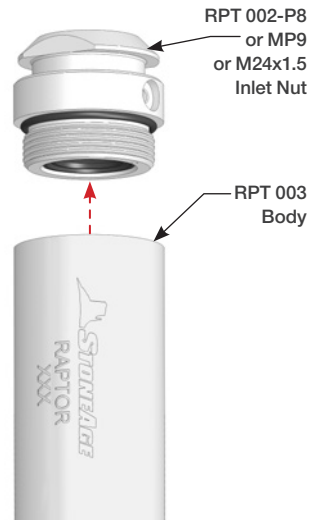


Figure 7: For Step 8

DISASSEMBLY

8. With a pick remove the Carbide Seat and High Pressure Seal from inside of the Shaft.

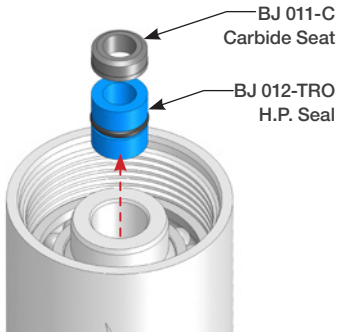


Figure 8: For Step 8

9. With a pick remove the O-Ring from around the Inlet Nut.
10. Gently pry the Shaft Seal out of the Inlet Nut with a common screwdriver.

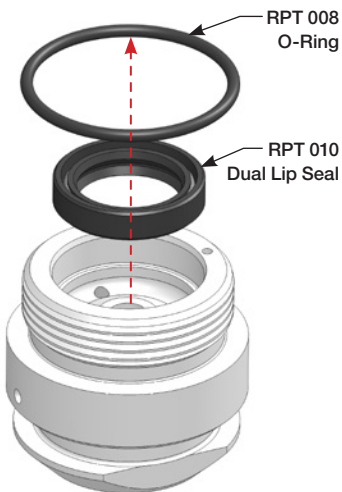


Figure 9: For Steps 9-10

11. Slide the Shaft Assembly out of the Body.
12. Remove all the Bearings from the Shaft.



TECH TIP: A bearing separator/puller set and an arbor press will help with the bearing removal from the Shaft.

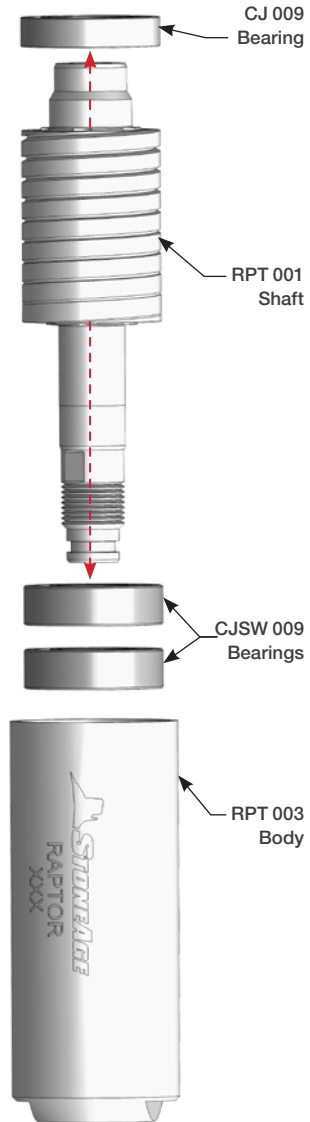


Figure 10: For Steps 11-12

13. Remove the SL 010 Shaft Seal from the RPT 003 Body with a pick or Snap Ring Pliers.

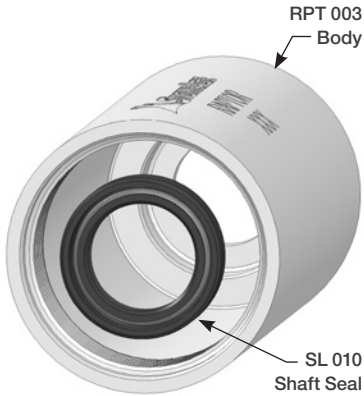


Figure 11: For Steps 13

DISASSEMBLY COMPLETE

NOTICE

Before reassembly of the tool
Wash all parts in solvent and blow dry
and
Inspect wear items, (High Pressure Seal
Assembly, O-Rings, and Port Plug.)

See the "Maintenance Kits" section of this
manual for a complete list of Service, Overhaul,
and, Tool kits.

ASSEMBLY

1. Lubricate the SL 010 and RPT 010 Shaft Seals with P-80® Grip-IT Lubricant or equivalent.
2. Put the RPT 010 Shaft Seal on the RPT 105 tool (LIP SIDE DOWN) and using an Arbor press, press the seal into the Body.
3. Put the SL 010 Shaft Seal on the RPT 105 tool (LIP SIDE DOWN) and using an Arbor press, press the seal into the Body.

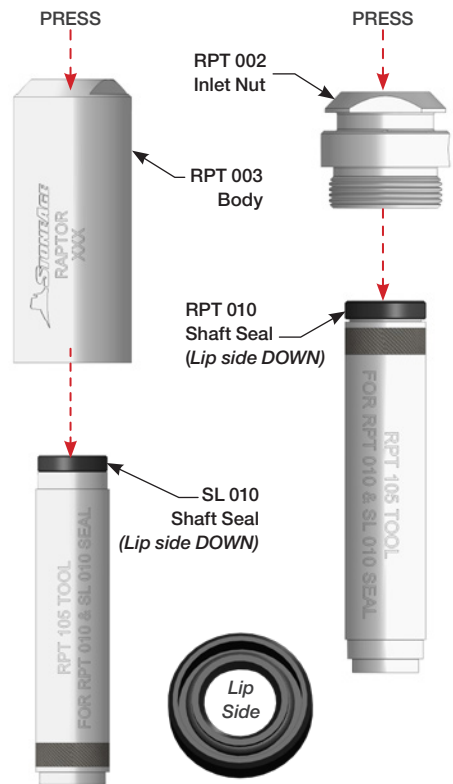


Figure 12: For Steps 1-3

- Press clean or new bearings onto shaft in the order shown below.

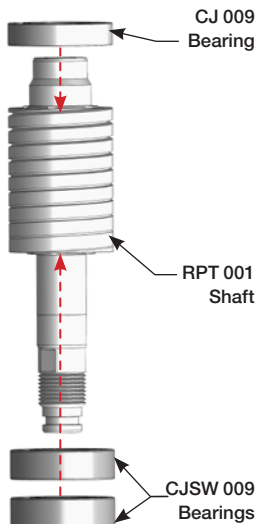


Figure 13: For Step 4

- Grease the Shaft Seal in the Body generously.
- Slide the Shaft Assembly into the Body.

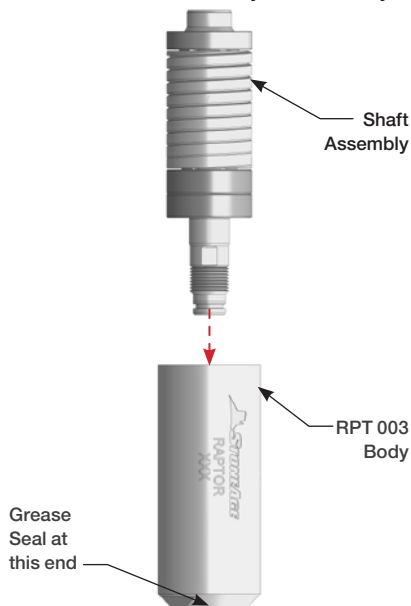


Figure 14: For Steps 5-6

- Grease H.P. Seal and insert into the Shaft. Push down enough to leave 1/16" recess for the Carbide Seat.
- The Carbide Seat should be inserted with the flat side down and nestle onto the H.P. Seal with the chamfer side facing up.

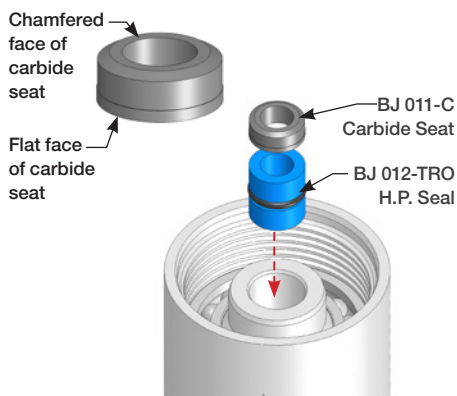


Figure 15: For Steps 7-8

- Fill tool with BJ 048-Fast or Slow viscous fluid. Turn shaft to remove bubbles in fluid and repeat until tool is completely full of viscous fluid.



Figure 16: For Steps 7-8

- Place O-Ring at base of Inlet Nut threads.



Figure 15: For Step 10

- Apply Anti-seize to the threads and screw the Inlet Nut into the Body
- Tighten down with an adjustable end wrench to 50 ft lbs.



Figure 16: For Steps 11-12

- Replace the Port Plug and Weep Seal.

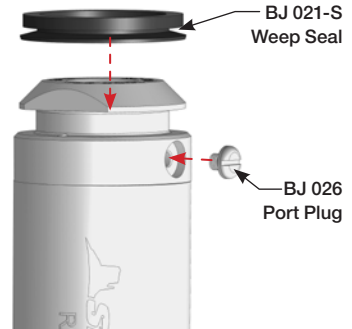


Figure 17: For Step 13

- Flip the Raptor in the vice and clamp down on the Inlet Nut flats.
- Slip the Backup O-Ring onto the Shaft first with the flat side down and concave side up to receive the regular O-Ring.

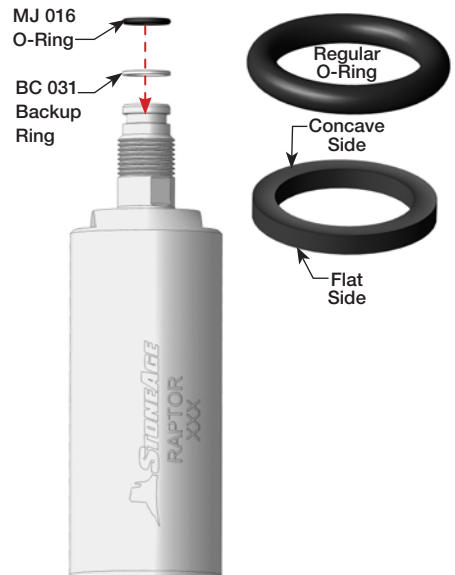
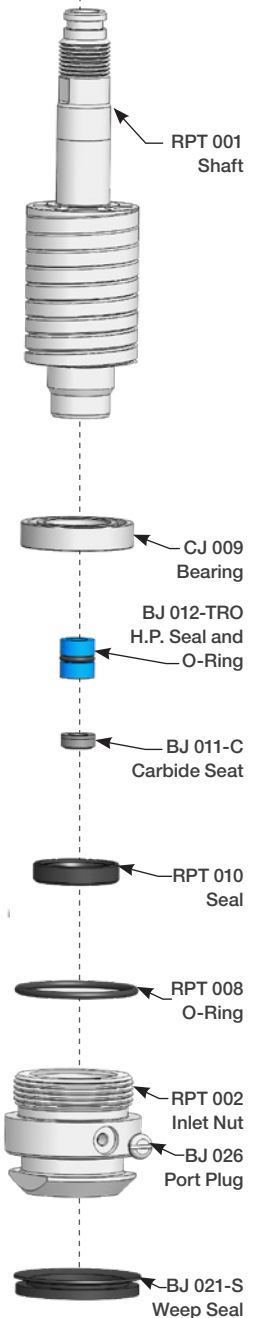
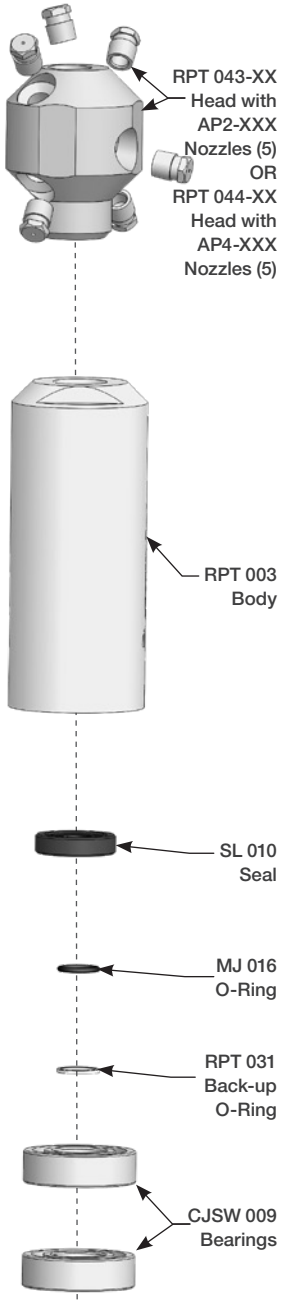


Figure 19: For Steps 14-15

16. Grease the O-Rings
17. Apply Anti-seize to the threads and screw the head onto the tool.
18. Place the flats on the Head in a vice and Tighten from the Shaft flats with an adjustable wrench.



Figure 20: For Steps 16-18

KITS	PART NUMBER OVERVIEW	
RPT 600-F or S SERVICE KIT 1 BJ 011-C Carbide Seat 1 BJ 012-TRO H.P. Seal & O-Ring 1 BJ 026 Port Plug 1 BJ 048-F Fast Viscous Fluid-6oz (-F) 1 BJ 048-S Slow Viscous Fluid-6oz (-S) 1 PL 543 Raptor User Manual	 <p>RPT 001 Shaft</p> <p>CJ 009 Bearing</p> <p>BJ 012-TRO H.P. Seal and O-Ring</p> <p>BJ 011-C Carbide Seat</p> <p>RPT 010 Seal</p> <p>RPT 008 O-Ring</p> <p>RPT 002 Inlet Nut BJ 026 Port Plug</p> <p>BJ 021-S Weep Seal</p>	 <p>RPT 043-XX Head with AP2-XXX Nozzles (5) OR RPT 044-XX Head with AP4-XXX Nozzles (5)</p> <p>RPT 003 Body</p> <p>SL 010 Seal</p> <p>MJ 016 O-Ring</p> <p>RPT 031 Back-up O-Ring</p> <p>CJSW 009 Bearings</p>
RPT 602 SEAL KIT 1 BJ 072 O-Ring 1 GO 123 O-Ring 1 RJ 011-KC Carbide Seat 1 RJ 012-KTO H.P. Seal & O-Ring		
RPT 610-F or S OVERHAUL KIT 1 BJ 011-C Carbide Seat 1 BJ 012-TRO H.P. Seal & O-Ring 1 BJ 021-S Weep Seal 1 BJ 026 Port Plug 1 BJ 048-F Fast Viscous Fluid-6oz (-F) 1 BJ 048-S Slow Viscous Fluid-6oz (-S) 2 CJ 009 Bearing 1 CJSW 009 Bearing 1 MJ 016 O-Ring 1 PL 543 Raptor User Manual 1 RPT 008 O-Ring 1 RPT 010 Dual Lip Seal 1 RPT 031 Back-up O-Ring 1 SL 010 Large Seal		
RPT 612 TOOL KIT 1 RPT 105 Double End Seal Press Tool 1 RPT 064 Raptor Fill Tube 1 RPT 106 Shaft Wrench		

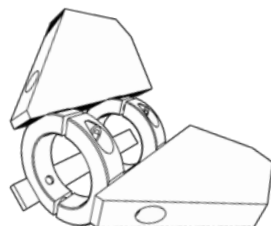
ACCESSORIES

CENTRALIZER OPTIONS

A centralizer helps to protect the tool as it passes through the pipe and balances jet standoff distance for more consistent cleaning. In cases where pipe size is more than 1.5 times the diameter of the tool, a centralizer is an important safety device, preventing the tool from turning around and thrusting backwards out of the pipe. Two types of centralizers are available for Raptor tools. See the tables below.

CENTRALIZER WITH SKIDS AND COLLARS

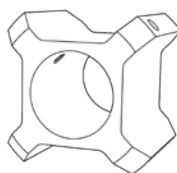
Pipe Size	Centralizer (Complete)	Weight	Collar*	Skid**
4 in. 100 mm	RPT 070-4	1.4 lb 0.6 kg	RPT 070.1	RJ 070.2-4
5 in. 127 mm	RPT 070-5	1.6 lb 0.7 kg	RPT 070.1	RJ 070.2-5
6 in. 152 mm	RPT 070-6	1.9 lb 0.9 kg	RPT 070.1	RJ 070.2-6
8 in. 203 mm	RPT 070-8	2.2 lb 1.0 kg	RPT 070.1	RJ 070.2-8
10 in. 254 mm	RPT 070-10	3.7 lb 1.7 kg	RPT 070.1	RJ 070.2-10
12 in. 305 mm	RPT 070-12	4.0 lb 1.8 kg	RPT 070.1	RJ 070.2-12



*Set of 2 collars **Set of 3 skids with 6 screws

PLASTIC CENTRALIZER WITH SET SCREWS

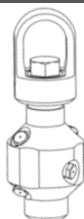
Pipe Size	Centralizer (Complete)	Weight
3 in. 76 mm	RPT 075-3	0.3 lb 0.1 kg
4.5 in. 114 mm	RPT 075-4.5	0.5 lb 0.2 kg



HEAD ACCESSORIES

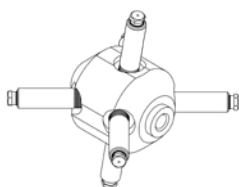
PULLING RING RPT 045

A pulling ring is available for 6-port Raptor heads.



EXTENSION NIPPLES

Extension nipples up to 12 inches are available for use with 6-port P4 Raptor heads. A complete list of Nozzles and Extensions is available in the StoneAge Tools Waterblast catalog and website.

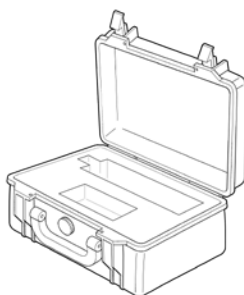


STORAGE

A Pelican™ brand protection/carrying case with custom cut foam insert is available for Raptor tool models.

CARRYING CASE

Exterior Dimensions (L x W x D)	Interior Dimensions (L x W x D)	Color	Case Part ID
11.6 x 8.3 x 3.8 in. 29.6 x 21.2 x 9.6 cm	10.5 x 6.0 x 3.2 in. 26.8 x 15.3 x 8.0 cm	Black	RPT 080

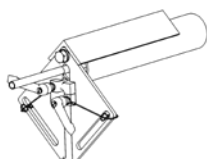


SAFETY OPTIONS

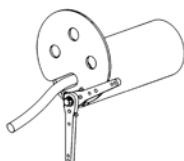
Backout preventers increase operator safety by keeping the tool from backing out of the pipe. Several options are available including fixtures for small diameter pipes, pipes with various flange bolt circle diameters, and adapters for pipes with no-flange entry.

BACKOUT PREVENTERS				
Pipe Size	Hose OD	Backout Preventer	Description	Weight
2–6 in. 51–150 mm	0.3–0.7 in. 8–18 mm	BJ 305*	Backout preventer for small pipes	5.6 lb 2.5 kg
4–8 in. 100–200 mm	0.3–1.5 in. 8–38 mm	BJ 310	Backout preventer for small to medium pipes	7.6 lb 3.4 kg
5–17 in. 130–430 mm	0.3–1.5 in. 8–38 mm	BJ 320	Backout preventer for medium to large pipes	6.3 lb 2.9 kg
15–36 in. 380–910 mm	N/A	BJ 325	Extension kit for BJ 320 backout preventer	8.5 lb 3.6 kg
8–36 in. 130–910 mm	N/A	BJ 340	No-flange kit for BJ 320 backout preventer	17 lb 7.7 kg

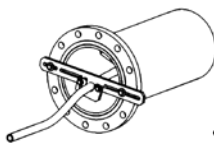
*Securing device not supplied



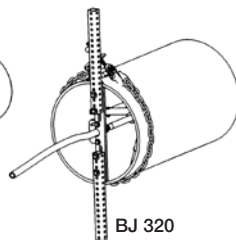
BJ 305



BJ 310



BJ 320



BJ 320
shown with BJ 325
extension kit and BJ 340
No-flange attachment kit

MAINTENANCE RESOURCES

Complete part breakdowns of each kit are available in the “Maintenance Kits” sections in this manual. Kit components and tool maintenance/assembly videos are also available on our website: WWW.STONEAGETOOLS.COM

For questions or help with a specific application, configuration or tool repairs, please contact StoneAge Customer Service.

KITS						
Rotation Speed	Service Kit	Seal Kit	Overhaul Kit	Tool Kit	Lubricant	Manual
Fast	RPT 600-F	RPT 602	RPT 610-F	RPT 612	BJ 048-F	PL 543
Slow	RPT 600-S	RPT 602	RPT 610-S	RPT 612	BJ 048-S	PL 543

TERMS AND CONDITIONS AND WARRANTY INFORMATION

1. Acceptance of Terms and Conditions. Receipt of these Terms and Conditions of Sale ("Terms and Conditions") shall operate as the acceptance by StoneAge, Inc. ("Seller") of the order submitted by the purchaser ("Buyer"). Such acceptance is made expressly conditional on assent by Buyer to these Terms and Conditions. Such assent shall be deemed to have been given unless written notice of objection to any of these Terms and Conditions (including inconsistencies between Buyer's purchase order and this acceptance) is given by Buyer to Seller promptly on receipt hereof.

Seller desires to provide Buyer with prompt and efficient service. However, to individually negotiate the terms of each sales contract would substantially impair Seller's ability to provide such service. Accordingly, the product(s) furnished by Seller are sold only according to the terms and conditions stated herein and with the terms and conditions stated in any effective StoneAge Dealer Agreement or StoneAge Reseller Agreement, if applicable. Notwithstanding any terms and conditions on Buyer's order, Seller's performance of any contract is expressly made conditional on Buyer's agreement to these Terms and Conditions unless otherwise specifically agreed to in writing by Seller. In the absence of such agreement, commencement of performance, shipment and/or delivery shall be for Buyer's convenience only and shall not be deemed or construed to be an acceptance of Buyer's terms and conditions.

2. Payment/Prices. Unless other arrangements have been made in writing between Seller and Buyer, payment for the product(s) shall be made upon receipt of invoice. The prices shown on the face hereof are those currently in effect. Prices invoiced shall be per pricelist in effect at the time of shipment. Prices are subject to increase for inclusion of any and all taxes which are applicable and which arise from the sale, delivery or use of the product(s), and the collection of which Seller is or may be responsible to provide to any governmental authority, unless acceptable exemption certificates are provided by Buyer in accordance with applicable law. Buyer shall pay all charges for transportation and delivery and all excise, order, occupation, use or similar taxes, duties, levies, charges or surcharges applicable to the product(s) being purchased, whether now in effect or hereafter imposed by any governmental authority, foreign or domestic.

3. Warranty. SELLER MAKES NO WARRANTIES OR REPRESENTATIONS AS TO THE PERFORMANCE OF ANY PRODUCT EXCEPT AS SET FORTH IN THE STONEAGE LIMITED WARRANTY PROVIDED WITH THE PRODUCT.

4. Delivery. Seller is not obligated to make delivery by a specified date, but will always use its best efforts to make delivery within the time requested. The proposed shipment date is an estimate. Seller will notify Buyer promptly of any material delay and will specify the revised delivery date as soon as practicable. UNDER NO CIRCUMSTANCES SHALL SELLER HAVE ANY LIABILITY WHATSOEVER FOR LOSS OF USE OR FOR ANY DIRECT OR CONSEQUENTIAL DAMAGES RESULTING FROM DELAY REGARDLESS OF THE REASON(S).

All product(s) will be shipped F.O.B. point of origin, unless specifically agreed otherwise, and Buyer shall pay all shipping costs and insurance costs from that point. Seller, in its sole discretion, will determine and arrange the means and manner of transportation of the product(s). Buyer shall bear all risk of loss commencing with the shipment or distribution of the product(s) from Seller's warehouse. Order shortages or errors must be reported within fifteen (15) business days from receipt of shipment to secure adjustment. No product(s) may be returned without securing written approval from Seller.

5. Modification. These Terms and Conditions are intended by Seller and Buyer to constitute a final, complete and exclusive expression of agreement relating to the subject matter hereof and cannot be supplemented or amended without Seller's prior written approval.

6. Omission. Seller's waiver of any breach or Seller's failure to enforce any of these Terms and Conditions at any time, shall not in any way affect, limit or waive Seller's right thereafter to enforce and compel strict compliance with every term and condition hereof.

7. Severability. If any provision of these Terms and Conditions is held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.

TERMS AND CONDITIONS AND WARRANTY INFORMATION

8. Disputes. Seller and Buyer shall attempt in good faith to promptly resolve any dispute arising under these Terms and Conditions by negotiations between representatives who have authority to settle the controversy. If unsuccessful, Seller and Buyer shall further attempt in good faith to settle the dispute by nonbinding third-party mediation, with fees and expenses of such mediation apportioned equally to each side. Any dispute not so resolved by negotiation or mediation may then be submitted to a court of competent jurisdiction in accordance with the terms hereof. These procedures are the exclusive procedures for the resolution of all such disputes between the Seller and Buyer.

9. Governing Law. All sales, agreements for sale, offers to sell, proposals, acknowledgments and contracts of sale, including, but not limited to, purchase orders accepted by Seller, shall be considered a contract under the laws of the State of Colorado and the rights and duties of all persons, and the construction and effect of all provisions hereof shall be governed by and construed according to the laws of such state.

STONEAGE TRADEMARK LIST

View the list of StoneAge's trademarks and service marks and learn how the trademarks should be used. Use of StoneAge trademarks may be prohibited, unless expressly authorized.

<http://www.StoneAgeTools.com/trademark-list/>

STONEAGE PATENT DATA

View the list of StoneAge's current U.S. patent numbers and descriptions.

<http://www.sapatents.com>

STONEAGE TERMS AND WARRANTY

View StoneAge's Terms and Warranty Conditions online.

<http://www.stoneagetools.com/terms>

<http://www.stoneagetools.com/warranty>

10. Jurisdiction and Venue. Seller and Buyer agree that the state or federal courts located within the City and County of Denver, Colorado shall have sole and exclusive jurisdiction over any litigation concerning any dispute arising under these Terms and Conditions not otherwise resolved pursuant to Section 9 as well as any alleged defects of any Products or damages sustained as a result of such alleged defects. Seller and Buyer further agree that should any litigation be commenced in connection with such a dispute, it shall only be commenced in such courts. Seller and Buyer agree to the exclusive jurisdiction of such courts and neither will raise any objection to the jurisdiction and venue of such courts, including as a result of inconvenience.

11. Attorney's Fees. If any litigation is commenced between Seller and Buyer, or their personal representatives, concerning any provision hereof, the party prevailing in the litigation shall be entitled, in addition to such other relief that is granted, to a reasonable sum as and for their attorneys' fees and costs in such litigation or mediation.

TERMS AND CONDITIONS AND WARRANTY INFORMATION

WARRANTY:

Warranties set forth herein extend only to End-Users, meaning customers acquiring, or that have previously acquired, a product manufactured by StoneAge ("Product") for their own use and not for resale, either directly from StoneAge Inc. ("StoneAge") or from a StoneAge Authorized Dealer or Reseller ("Dealer"). No warranty of any kind or nature is made by StoneAge beyond those expressly stated herein.

1. LIMITED WARRANTY PERIOD. Subject to the limitations and conditions hereinafter set forth, StoneAge warrants its Product to be free from defects in workmanship and material for a period of one (1) year from the date of purchase by the End-User, provided that the end of the limited warranty period shall not be later than eighteen (18) months from the date of shipment of the Product to the Dealer or the End-User by StoneAge ("Limited Warranty Period"). All replacement parts which are furnished under this Limited Warranty and properly installed shall be warranted to the same extent as the original Product under this Limited Warranty if, and only if, the original parts were found to be defective within the original Limited Warranty Period covering the original Product. Replacement parts are warranted for the remainder of the original Limited Warranty Period. This Limited Warranty does not cover any component part of any Product not manufactured by StoneAge. Any such component part is subject exclusively to the component manufacturer's warranty terms and conditions.

2. LIMITED WARRANTY COVERAGE. StoneAge's sole obligation under this Limited Warranty shall be, at StoneAge's option and upon StoneAge's inspection, to repair, replace or issue a credit for any Product which is determined by StoneAge to be defective in material or workmanship. StoneAge reserves the right to examine the alleged defective Product to determine whether this Limited Warranty is applicable, and final determination of limited warranty coverage lies solely with StoneAge. No statement or recommendation made by a StoneAge representative, Dealer or agent to End-User shall constitute a warranty by StoneAge or a waiver or modification to any of the provisions hereof or create any liability for StoneAge.

3. WARRANTY SERVICE PROVIDERS. Service and repair of the Product is to be performed only by StoneAge authorized service representatives, including Dealers who are authorized repair centers, with StoneAge approved parts. Information about StoneAge authorized service representatives can be obtained through the StoneAge website at www.stoneagetools.com/service. Unauthorized service, repair or

modification of the Product or use of parts not approved by StoneAge will void this Limited Warranty. StoneAge reserves the right to change or improve the material and design of the Product at any time without notice to End-User, and StoneAge is not obligated to make the same improvements during warranty service to any Product previously manufactured.

4. WARRANTY EXCLUSIONS. This Limited Warranty does not cover, and StoneAge shall not be responsible for the following, or damage caused by the following: (1) any Product that has been altered or modified in any way not approved by StoneAge in advance in writing; (2) any Product that has been operated under more severe conditions or beyond the rated capacity specified for that Product; (3) depreciation or damage caused by normal wear and tear, failure to follow operation or installation instructions, misuse, negligence or lack of proper protection during storage; (4) exposure to fire, moisture, water intrusion, electrical stress, insects, explosions, extraordinary weather and/or environmental conditions including, but not limited to lightning, natural disasters, storms, windstorms, hail, earthquakes, acts of God or any other force majeure event; (5) damage to any Product caused by any attempt to repair, replace, or service the Product by persons other than StoneAge authorized service representatives; (6) costs of normal maintenance parts and services; (7) damage sustained during unloading, shipment or transit of the Product; or (8) failure to perform the recommended periodic maintenance procedures listed in the Operator's Manual accompanying the Product.

5. REQUIRED WARRANTY PROCEDURES. To be eligible for warranty service, the End-User must: (1) report the Product defect to the entity where the Product was purchased (i.e. StoneAge or the Dealer) within the Limited Warranty Period specified in this Limited Warranty; (2) submit the original invoice to establish ownership and date of purchase; and (3) make the Product available to a StoneAge authorized service representative for inspection to determine eligibility for coverage under this Limited Warranty. This Limited Warranty shall not extend to any person or entity who fails to provide proof of original purchase from StoneAge or a Dealer. No Product may be returned for credit or adjustment without prior written permission from StoneAge.

TERMS AND CONDITIONS AND WARRANTY INFORMATION

6. **DISCLAIMER OF IMPLIED WARRANTIES AND OTHER REMEDIES.** EXCEPT AS EXPRESSLY STATED HEREIN (AND TO THE FULLEST EXTENT ALLOWED UNDER APPLICABLE LAW), STONEAGE HEREBY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND ANY AND ALL WARRANTIES, REPRESENTATIONS OR PROMISES AS TO THE QUALITY, PERFORMANCE OR FREEDOM FROM DEFECT OF THE PRODUCT COVERED BY THIS LIMITED WARRANTY. STONEAGE FURTHER DISCLAIMS ALL IMPLIED INDEMNITIES.

7. **LIMITATION OF LIABILITY.** End-User specifically acknowledges that the Product may be operated at high speeds and/or pressures, and that as such it may be inherently dangerous if not used correctly. End-User shall familiarize itself with all operation materials provided by StoneAge and shall at all times use and require its agents, employees and contractors to use all necessary and appropriate safety devices, guards and proper safe operating procedures. In no event shall StoneAge be responsible for any injuries to persons or property caused directly or indirectly by the operation of the Product if End-User or any agent, employee, or contractor of End-User: (1) fails to use all necessary and appropriate safety devices, guards and proper safe operating procedures; (2) fails to maintain in good working order such safety devices and guards; (3) alters or modifies the Product in any way not approved by StoneAge in advance in writing; (4) allows the Product to be operated under more severe conditions or beyond the rated capacity specified for the Product; or (5) otherwise negligently operates the Product. End-User shall indemnify and hold StoneAge harmless from any and all liability or obligation incurred by or against StoneAge, including costs and attorneys' fees, to or by any person so injured.

TO THE FULL EXTENT ALLOWED BY APPLICABLE LAW, STONEAGE SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES (INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF GOODWILL, DIMINUTION OF VALUE, WORK STOPPAGE, INTERRUPTION OF BUSINESS, RENTAL OF SUBSTITUTE PRODUCT, OR OTHER COMMERCIAL LOSS EVEN TO THE EXTENT SUCH DAMAGES WOULD CONSTITUTE DIRECT DAMAGES), WITH RESPECT TO THE COVERED STONEAGE PRODUCT, OR OTHERWISE IN CONNECTION WITH THIS LIMITED WARRANTY, REGARDLESS OF WHETHER STONEAGE HAS BEEN

ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

IT IS UNDERSTOOD THAT STONEAGE'S LIABILITY, WHETHER IN CONTRACT, IN TORT, UNDER ANY WARRANTY, IN NEGLIGENCE, OR OTHERWISE SHALL NOT EXCEED THE AMOUNT OF THE PURCHASE PRICE PAID BY THE END-USER FOR THE PRODUCT. STONEAGE'S MAXIMUM LIABILITY SHALL NOT EXCEED, AND END-USER'S REMEDY IS LIMITED TO EITHER (1) REPAIR OR REPLACEMENT OF THE DEFECTIVE WORKMANSHIP OR MATERIAL OR, AT STONEAGE'S OPTION, (2) REFUND OF THE PURCHASE PRICE, OR (3) ISSUANCE OF A CREDIT FOR THE PURCHASE PRICE, AND SUCH REMEDIES SHALL BE END-USER'S ENTIRE AND EXCLUSIVE REMEDY.

YOU, THE END-USER, UNDERSTAND AND EXPRESSLY AGREE THAT THE FOREGOING LIMITATIONS ON LIABILITY ARE PART OF THE CONSIDERATION IN THE PRICE OF THE STONEAGE PRODUCT YOU PURCHASED.

Some jurisdictions do not allow the limitation or exclusion of liability for certain damages, so the above limitations and exclusions may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights which vary from jurisdiction to jurisdiction. If any provisions of this Limited Warranty is held to be invalid or unenforceable, such invalidity or unenforceability shall not affect the validity or enforceability of the other portions hereof.



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