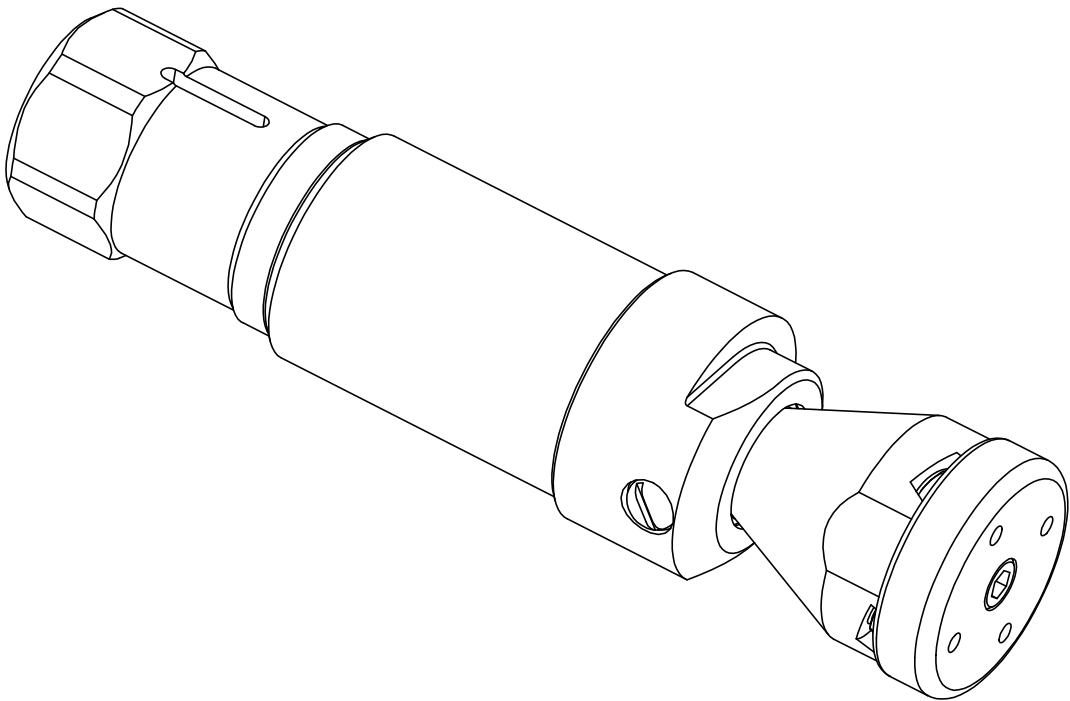


ROTARY WATERBLAST NOZZLE

BARRACUDA-UH

OPERATION AND MAINTENANCE MANUAL



 **STONEAGE**TM
WATERJET TOOLS

54 Girard St. Durango, Colorado 81303
www.stoneagetools.com

(970) 259-2869 Phone (970) 259-2868 Fax
sales@stoneagetools.com

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1.0 INTRODUCTION

This manual was prepared to provide the operator with the basic information needed to operate and service this equipment. The operating recommendations in the manual will ensure that you receive satisfactory performance. All operating personnel responsible for the care of this equipment should be familiar with the information in this manual.

If you have any questions or problems with this equipment, please contact the distributor you obtained the product from, or the manufacturer:

StoneAge, Inc.
54 Girard St.
Durango, CO 81303
970-259-2869 Phone 970-259-2868 Fax
www.stoneagetools.com

2.0 SAFETY WARNING

Operations with this equipment can be potentially dangerous if caution is not exercised prior to and during tool use. Please read and follow all of these instructions, in addition to the guidelines in the WJTA Recommended Practices handbook.

- 2.1 Only competent and trained persons should operate this equipment.
- 2.2 Do not exceed the maximum operating pressure specified for any component in a system.
- 2.3 This equipment should always be used with an operator controlled dump mechanism to release the high pressure water.
- 2.4 The immediate work area should be marked off to keep out untrained persons.
- 2.5 All personnel in the area should wear eye and hearing protection, as well as other protective clothing in accordance with specific conditions.
- 2.6 Use of a jetting gun with a barrel that is 48" long is recommended. Jet thrust should be less than 1/3 the weight of the operator.
- 2.7 Inspect the equipment for visible signs of deterioration, damage, or improper assembly. Do not operate until repaired. Make sure all threaded connections are tight and leak free.
- 2.8 Check to see that all control functions work properly before going to high pressure.
- 2.9 The jetting gun must have either a dump or dry shutoff valve. The person operating the gun should have direct control of the dump system.

3.0 DESCRIPTION

The **Barracuda-UH** is a self-rotating swivel designed for handheld shotgun waterblast cleaning. The powerful rotating jets cover a large area for efficient cleaning. Jet reaction force powers rotation of the head. An internal centrifugal speed control maintains rotation speeds of 1000 to 2000 rpm.

The BC-UH has a straight flow through design with a leak free high pressure seal, so no pump power is wasted. The high pressure seal can be expected to last from 50 to 100 hours, and is simple to replace. The tool can be used at operating pressures up to 40,000 psi. The tool has a 9/16 high pressure female inlet. Two heads are available; the low flow head (BC 351-4-18) operates with flow rates from 3 to 4 gpm. The BC 351-4-15 head is used for higher flow rates. Both heads have 7/16-20 nozzle ports for sapphire nozzle assemblies. The orifice sizes should be selected to match the flow and pressure of the pump. Two ports may be plugged if desired, but larger nozzles need to be used to compensate.

The Barracuda-UH uses automatic transmission fluid (ATF) as a lubricant for the bearings and speed control components. It can be flushed/refilled with ATF through the fill port using a syringe. This is recommended after every 20 to 40 hours of operation.

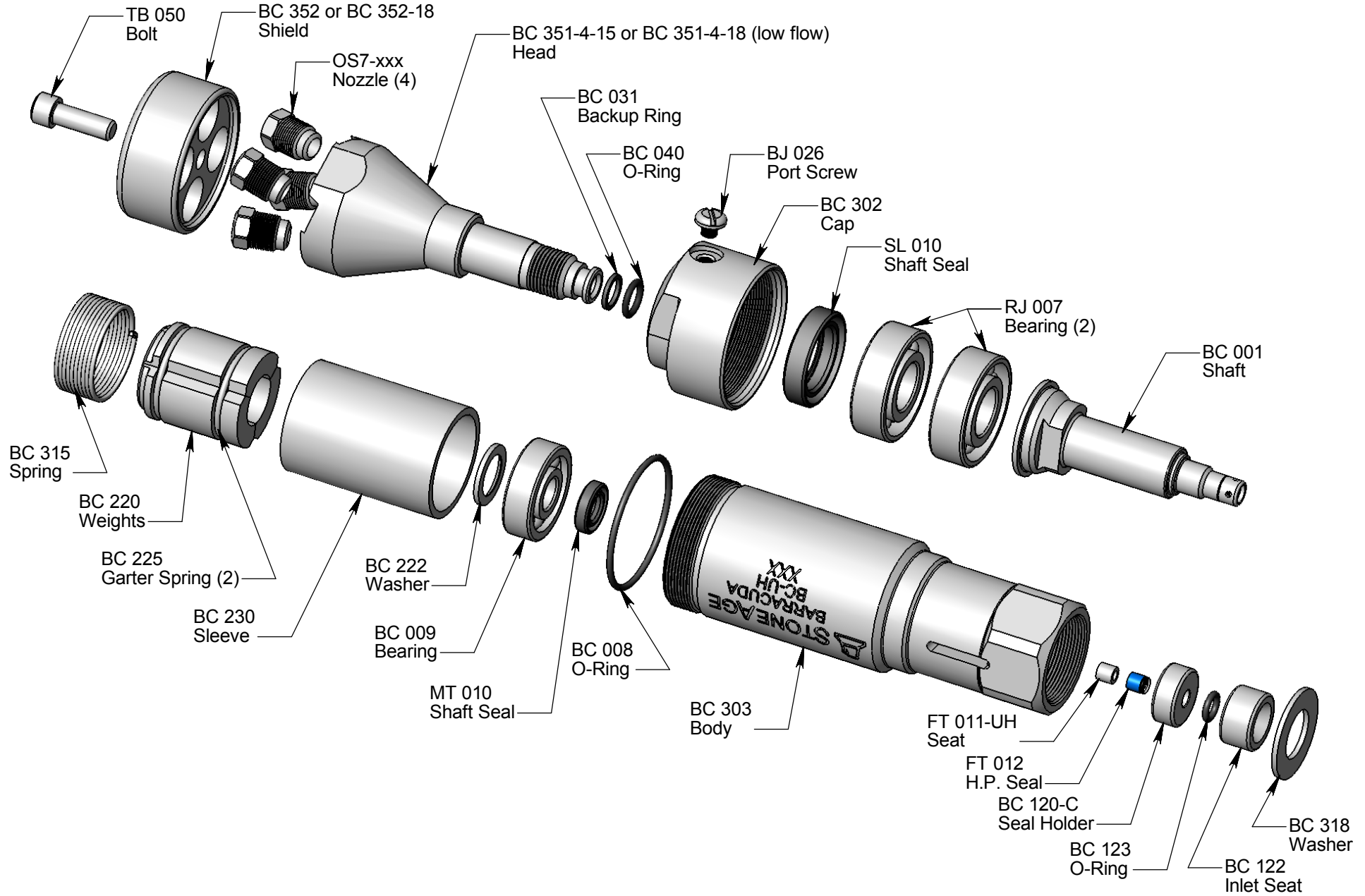
4.0 PARTS LIST

| <u>Part #</u> | <u>Description</u> | <u>Qty</u> |
|---------------|--------------------------|------------|
| BC 001 | Shaft | 1 |
| BC 008 | O-Ring | 1 |
| BC 009 | Bearing | 1 |
| BC 031 | Backup Ring | 1 |
| BC 040 | O-Ring | 1 |
| GP 042 | ATF Lubricant | |
| BC 120-C | Seal Holder | 1 |
| BC 122 | Inlet Seat | 1 |
| BC 123 | O-Ring | 1 |
| BC 220 | Weights | 1 |
| BC 222 | Washer | 1 |
| BC 225 | Garter Spring | 2 |
| BC 230 | Bronze Sleeve | 1 |
| BC 302 | Cap | 1 |
| BC 303 | Body | 1 |
| BC 315 | Spring | 1 |
| BC 318 | Washer | 1 |
| BC 351-4-15 | Head | 1 |
| BC 351-4-18 | Head, Low Flow | * |
| BC 352 | Shield | 1 |
| BC 352-18 | Shield for low flow head | * |
| BJ 026 | Port Screw | 1 |
| FT 011-UH | Carbide Seat | 1 |
| FT 012 | H.P. Seal | 1 |
| MT 010 | Shaft Seal | 1 |
| RJ 007 | Bearing | 2 |
| SL 010 | Shaft Seal | 1 |
| TB 050 | Bolt, Shield | 1 |

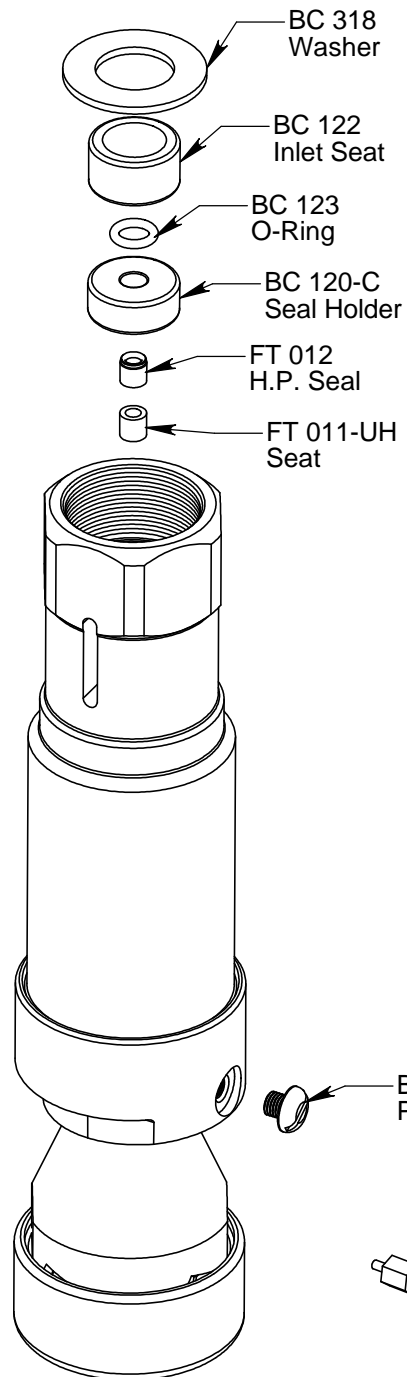
Also available separately:

| | | |
|-----------|--------------|---|
| BC 600-UH | Service Kit | (Includes items needed for maintenance) |
| BC 602-UH | Seal Kit | (Includes parts needed for one seal change) |
| BC 610-UH | Overhaul Kit | (Includes parts needed for tool rebuild) |
| BC 612 | Tool Kit | (Includes tools to aid assembly) |

BC-UH EXPLODED ASSEMBLY DRAWING

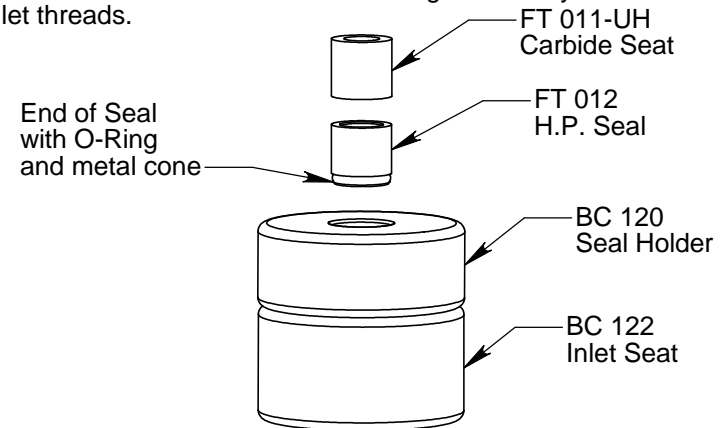


6.0 BC-UH HIGH PRESSURE SEAL MAINTENANCE AND LUBRICATION



To replace the high pressure seal:

1. Remove the Washer (BC 318) from inlet port. It is easiest to push it upward from the top of the slot.
2. Use two picks inserted thru the slots to pry the Seal Holder (BC 120-C) and Inlet Seat (BC 122) up and out of the Body.
3. Remove the H.P. Seal (FT 012) and Carbide Seat (FT 011-UH). Inspect the Seal Holder for grooves. If it is badly grooved on one end, it can be flipped over or replaced.
4. Inspect Carbide Seat (FT 011-UH) for chips or erosion. Replace if damaged. Inspect end of shaft for dings.
5. Check that O-Ring (BC 123) is in groove of Inlet Seat (BC 122). Place Seal Holder (BC 120-C) on top of Inlet Seat (against the side with the O-Ring).
6. Apply grease to a new H.P. Seal and install in Seal Holder. The end with the O-Ring and metal cone faces away from the Carbide Seat. Apply grease to the face of the Carbide Seat and install against H.P. Seal.
7. Balance the Inlet Seat and Seal Holder on fingertip; turn swivel upside down (nozzles up) and slide the Inlet Seat and Seal Holder into the Body. Make certain that the Carbide Seat stays in Seal Holder.
8. Turn the swivel inlet end up; the Inlet Seat and Seal Holder should be far enough into Body to install the Washer (BC 318) into the groove below the inlet threads.

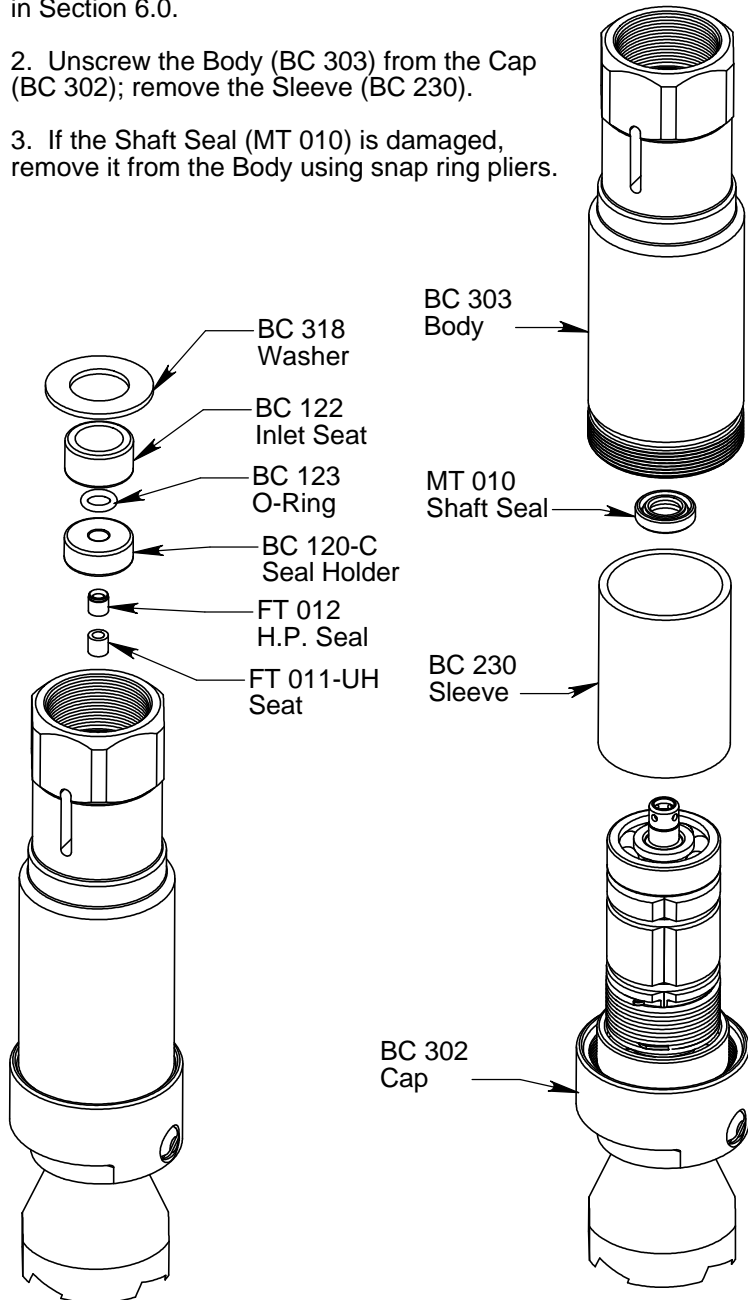


The BC-UH uses ATF (automatic transmission fluid) for lubrication. It is recommended that a full syringe of fresh fluid be added to the swivel after every 20 to 40 hours of operation.

1. Remove the Port Screw (BJ 026)
2. Thread the Syringe (BC 410) into the port.
3. Squeeze fresh ATF into the swivel; excess will come out the slots.
4. Remove Syringe and install Port Screw.

6.1 BC-UH DISASSEMBLY INSTRUCTIONS

1. Remove the Washer (BC 318) from the inlet port of the Body. Pry out the Seal Holder (BC 120-C) and Inlet Seat (BC 122) as explained in Section 6.0.
2. Unscrew the Body (BC 303) from the Cap (BC 302); remove the Sleeve (BC 230).
3. If the Shaft Seal (MT 010) is damaged, remove it from the Body using snap ring pliers.



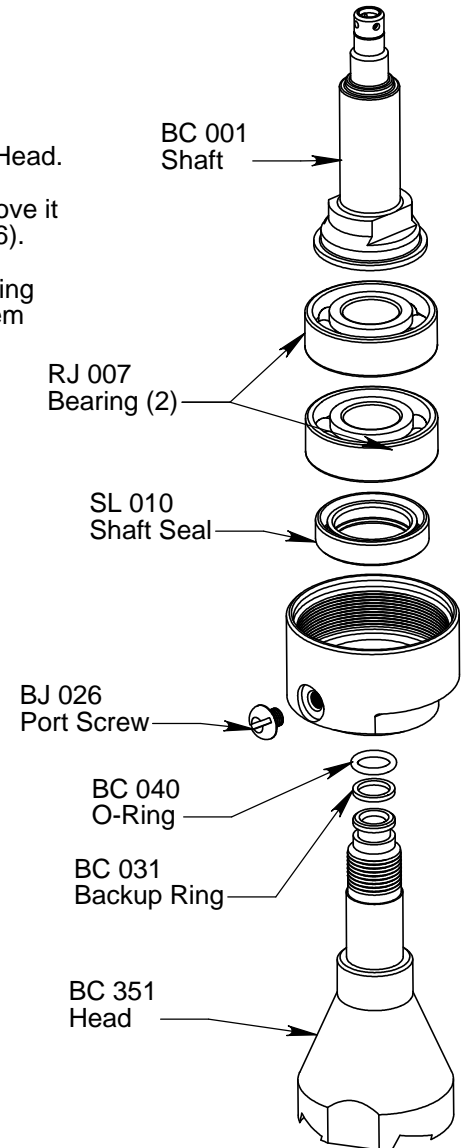
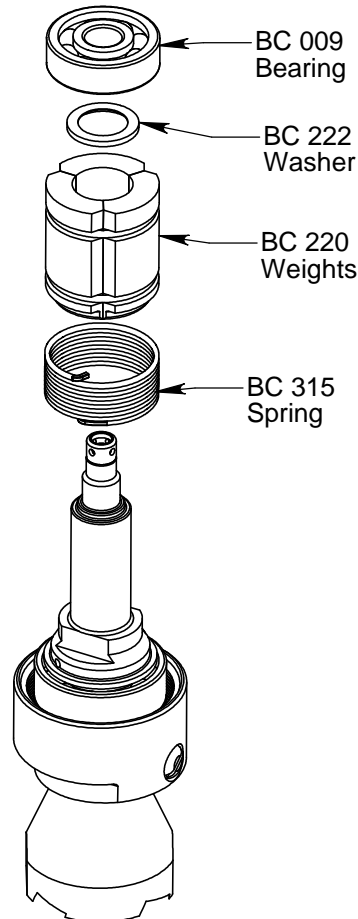
4. Pull the Bearing (BC 009) from the Shaft. Remove the Washer (BC 222).

5. Unhook the Spring (BC 315) from the hole in the Shaft; remove the Weights (BC 220) and Spring (BC 315) from the Shaft. Leave the Weights together.

6. Unscrew the Shaft (BC 001) from the Head (BC 351) and pull up on the Cap (BC 302) to remove it and the Bearings (RJ 007) from the Head.

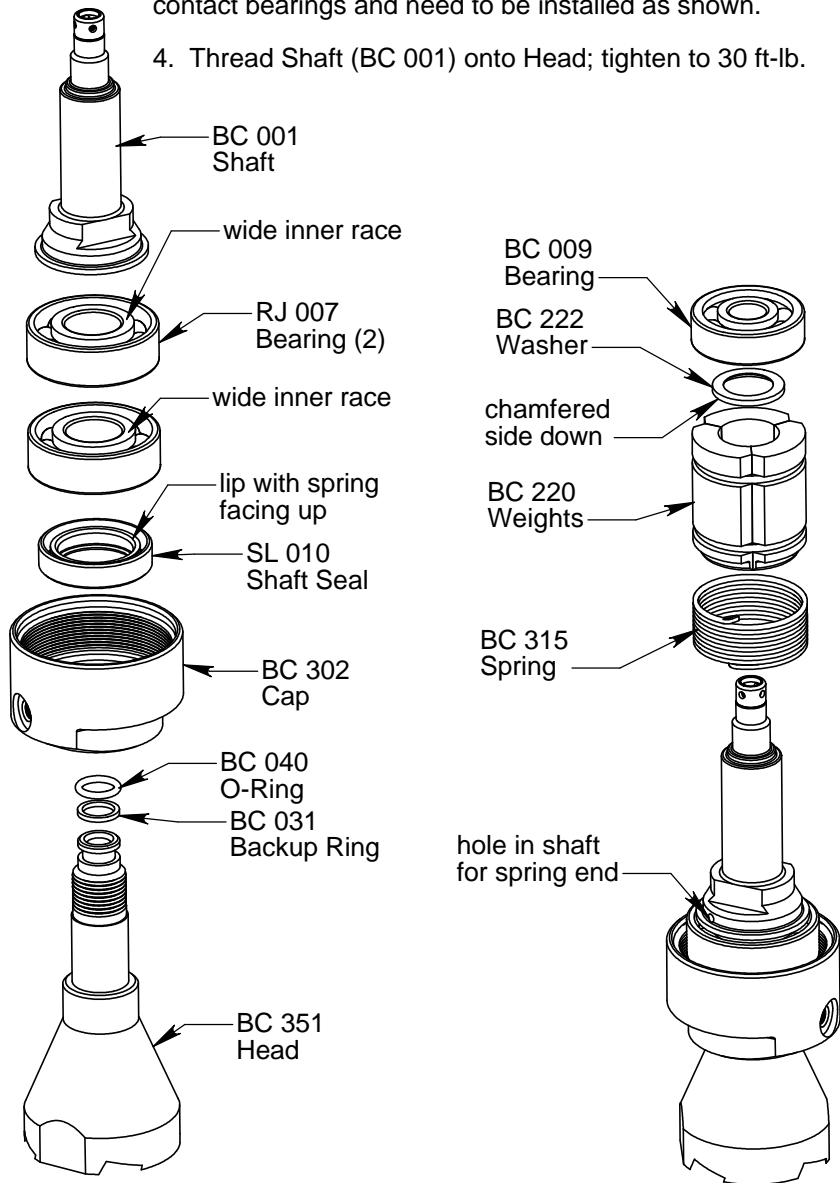
7. If the Shaft Seal (SL 010) is damaged, remove it from the Cap. Remove the Port Screw (BJ 026).

8. Inspect the O-Ring (BC 040) and Backup Ring (BC 031) on the end of the Head. Remove them if they are damaged.



6.2 BC-UH ASSEMBLY INSTRUCTIONS

1. Install Backup Ring (BC 031) and O-Ring (BC 040) on Head (BC 351). Note order they sit. Apply anti-seize to threads and grease to O-Rings.
2. Install Shaft Seal (SL 010) in Cap (BC 302). Apply Armour-All to lips of seal; slide Cap onto Head.
3. Install Bearings (RJ 007) on Head. These are angular contact bearings and need to be installed as shown.
4. Thread Shaft (BC 001) onto Head; tighten to 30 ft-lb.



5. Insert Spring (BC 315) end into hole in Weights (BC 220), then slide Weights and Spring onto Shaft; insert other spring end into hole in Shaft.

6. Place Washer (BC 222) on top of Weights, with chamfered face of washer facing toward Weights.

7. Slide Bearing (BC 009) onto Shaft. Slide Sleeve (BC 230) over the assembly.

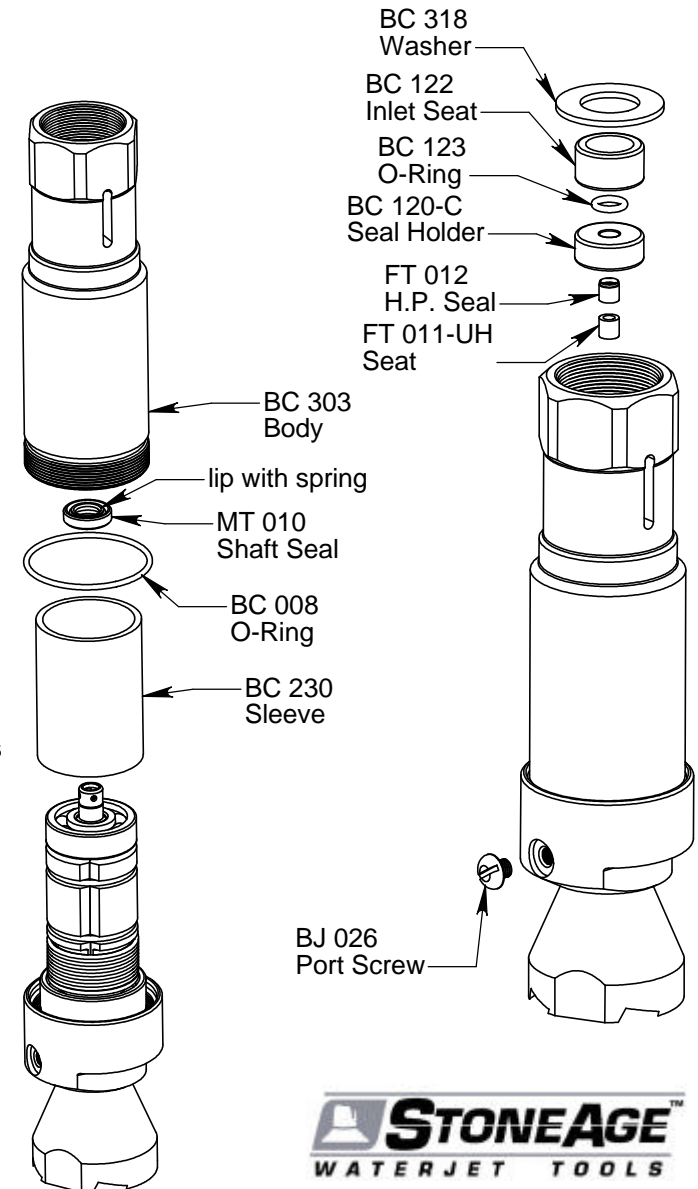
8. Install O-Ring (BC 008) onto Body (BC 303).

9. Install Shaft Seal (MT 010) into Body.

10. Apply anti-seize to threads of Body; thread into Cap. Tighten to 45 ft-lb.

11. Install the high pressure seal components as shown in Section 6.0.

12. Fill the tool with ATF as shown in Section 6.0. Install Port Screw (BJ 026).



STONEAGE™
WATERJET TOOLS

6.3 TROUBLESHOOTING GUIDE

| SYMPTOM | PROBLEM | SOLUTION |
|-------------------------|---|--|
| Leaks out slots in Body | Loose inlet fitting Worn H.P. seal Eroded seat Damaged shaft end | Tighten inlet fitting Replace H.P. Seal (FT 012) Replace Seat (FT 011-UH) Face or replace Shaft |
| Seals wear out quickly | Damaged seat Worn Seal Holder | Replace Seat (FT 011-UH) Replace Seal Holder (BC 120-C) |
| Will not rotate | Not enough jet torque Internal damage Improper assembly | Check nozzles for plugging or wear, refer to nozzle selection chart. Rotate head by hand, if rough to turn, check spring and bearings Inspect and repair |
| Water inside tool | Bad H.P. Seal leak Bad O-Ring Worn shaft seals | Replace H.P. Seal Replace O-Ring, Backup Ring (BC 040, BC 031) Replace shaft seals |

7.0 LIMITED WARRANTY

StoneAge, Inc. warrants to the extent herein provided the products of its own manufacture against defects in material and workmanship under normal use and service for which the products were designed for a period of six months after shipment from the factory. If such products should fail through defect in workmanship or material and specific written notice of failure is made within six months after date of shipment from factory, StoneAge, Inc. will either repair or replace any such items, F.O.B. its factory without charge. StoneAge, Inc. shall not be liable for expense incurred in repairs or alterations made outside the factory without the proper and prior authorization. StoneAge, Inc. shall have the option of requiring the return of the defective products to its factory, with transportation charges prepaid, to establish the claim. StoneAge, Inc. shall in no event be held liable for damages or delay resulting from or arising out of defective products nor for consequential damages or otherwise except for repair or replacement of items of defective material or workmanship aforesaid.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE AND NEITHER ASSUMES, NOR AUTHORIZES ANY PERSON TO ASSUME FOR STONEAGE, INC. ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. THIS WARRANTY SHALL NOT APPLY TO PRODUCTS OR ANY PARTS THEREOF WHICH HAVE BEEN SUBJECT TO ACCIDENT, NEGLIGENCE, ALTERATION, ABUSE, OR MISUSE. STONEAGE, INC. MAKES NO WARRANTY WHATSOEVER IN RESPECT TO ACCESSORIES, PARTS OR PRODUCTS NOT MANUFACTURED BY STONEAGE, INC.

APPENDIX GP 042 ATF

VALVOLINE OIL CO — NAPA AUTOMATIC TRANS FLUID DEXRON II

MSDS Safety Information

FSC: 9150
NIIN: 00-698-2382
MSDS Date: 05/25/1993
MSDS Num: BTHVD
Product ID: NAPA AUTOMATIC TRANS FLUID DEXRON II
MFN: 01
Responsible Party
Cage: 72527
Name: VALVOLINE OIL CO
Address: 200 E MAIN ST
Box: 14000
City: LEXINGTON KY 40512
Info Phone Number: 606-265-7000
Emergency Phone Number: 606-265-7000
Review Ind: Y
Published: Y

Contractor Summary

Cage: 72527
Name: VALVOLINE OIL
Address: 3499 DABNEY DRIVE
Box: 14000
City: LEXINGTON KY 40512
Phone: 606-357-7847/606-264-7000

Item Description Information

Item Manager: S9G
Item Name: HYDRAULIC FLUID,AUTOMATIC TRANSMISSION
Unit of Issue: QT
UI Container Qty: 1 QUART

Ingredients

RTECS #: 1008918AT
Name: AUTOMATIC TRANSMISSION FLUID PACKAGE
% Wt: 10-25 %
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: NOT ESTABLISHED

Cas: 64742-65-0
RTECS #: PY8038500
Name: MINERAL OIL, PETROLEUM DISTILLATES, SOLVENT-DEWAXED HEAVY
PARAFFINIC
% Wt: 85-100%
Other REC Limits: 5 MG/M3 OIL MIST
OSHA PEL: NOT ESTABLISHED
ACGIH TLV: 5 MG/M3 (OIL MIST)

Health Hazards Data

LD50 LC50 Mixture: NOT ESTABLISHED FOR PRODUCT
Route Of Entry Inds - Inhalation: NO
Skin: YES
Ingestion: NO
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: MAY CAUSE SLIGHT EYE IRRITATION. PROLONGED OR REPEATED CONTACT MAY BE MILDLY IRRITATING TO THE SKIN AND MAY CAUSE DERMATITIS. INHALATION NOT EXPECTED TO BE A HAZARD AT NORMAL ROOM TEMPERATURES. HOWEVER IF EXPOSURES EXCEED 5 MG/M3 FOR OIL MI ST, THEN RESPIRATORY IRRITATION MAY RESULT. INGESTION MAY CAUSE GI TRACT IRRITATION
Explanation Of Carcinogenicity: THIS PRODUCT IS NOT LISTED BY IARC, NTP OR OSHA AS A CARCINOGEN, MUTAGEN, TERATOGEN OR NEUROTOXIN.
Signs And Symptions Of Overexposure: EYE IRRITATION, TEARING, BLURRING OF VISION. SKIN IRRITATION, DERMATITIS. RESPIRATORY IRRITATION, POSSIBLE DISCOMFORT. LAXATIVE EFFECTS, NAUSEA, ABDOMINAL CRAMPS, DIARRHEA.

Medical Cond Aggravated By Exposure: NONE SPECIFIED BY MANUFACTURER.
First Aid: SKIN: WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION. REMOVE CONTAMINATED CLOTHING AND LAUNDRER BEFORE REUSE. EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR 15 MINUTES. GET MEDICAL ATTENTION. IN GESTION: DO NOT INDUCE VOMITING. KEEP PERSON WARM AND QUIET. GET MEDICAL ATTENTION.

=====
Handling and Disposal
=====

Spill Release Procedures: ABSORB LIQUID ON VERMICULITE, FLOOR ABSORBENT OR OTHER ABSORBENT MATERIAL. PREVENT RUN-OFF TO SEWERS, STREAMS OR OTHER BODIES OF WATER. COLLECT FOR DISPOSAL.
Neutralizing Agent: NONE SPECIFIED BY MANUFACTURER.
Waste Disposal Methods: PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSAL CONTAINER OR LINER IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.
Handling And Storage Precautions: AVOID CONTACT WITH EYES AND SKIN. DO NOT USE CUTTING OR WELDING TORCH ON THIS CONTAINER (EVEN EMPTY). DO NOT TRANSFER TO UNLABELED CONTAINER.
Other Precautions: EMPTY CONTAINERS RETAIN PRODUCT RESIDUE AND CAN BEDANGEROUS. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL OR EXPOSESUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY OR OTHER SOURCESOF IGNITION; THEY MAY EXPLODE.

=====
Fire and Explosion Hazard Information
=====

Flash Point Method: COC
Flash Point Text: 320F,160C
Lower Limits: NOT GIVEN
Upper Limits: NOT GIVEN
Extinguishing Media: REGULAR FOAM OR CARBON DIOXIDE OR DRY CHEMICAL
Fire Fighting Procedures: WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND FULL FACE-PIECE SELF-CONTAINED BREATHING APPARATUS. WATER OR FOAM MAY CAUSE FROTHING WHICH CAN BE DANGEROUS.
Unusual Fire/Explosion Hazard: NEVER USE WELDING OR CUTTING TORCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

=====
Control Measures
=====

Respiratory Protection: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.
Ventilation: NOT REEQUIRED UNDER NORMAL CONDITIONS OF USE.
Protective Gloves: NOT NORMALLY REQUIRED.
Eye Protection: NOT REQUIRED UNDER NORMAL CONDITIONS
Other Protective Equipment: NORMAL WORK CLOTHING COVERING ARMS AND LEGS.
Work Hygienic Practices: WASH WITH SOAP AND WATER AFTER HANDLING PRODUCT AND BEFORE EATING DRINKING OR SMOKING.
Supplemental Safety and Health: NONE SPECIFIED BY MANUFACTURER.

=====
Physical/Chemical Properties
=====

HCC: V6
B.P. Text: >425F,>218C
M.P/F.P Text: NOT GIVEN
Decomp Text: UNKNOWN
Vapor Pres: <0.10
Vapor Density: > 1
Spec Gravity: 0.870
Solubility in Water: NEGLIGIBLE
Appearance and Odor: RED LIQUID
Corrosion Rate: UNKNOWN

=====
Reactivity Data
=====

Stability Indicator: YES
Stability Condition To Avoid: EXTREME TEMPERATURES, SPARKS
Materials To Avoid: STRONG OXIDIZING AGENTS
Hazardous Decomposition Products: NONE SPECIFIED BY MANUFACTURER.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NONE. WILL NOT OCCUR.

=====
Transportation Information
=====

Responsible Party Cage: 72527
Trans ID NO: 82679
Product ID: NAPA AUTOMATIC TRANS FLUID DEXRON II
MSDS Prepared Date: 05/25/1993

Review Date: 05/17/1994
MFN: 1
Net Unit Weight: 1.8 LBS
Multiple KIT Number: 0
Review IND: Y
Unit Of Issue: QT
Container QTY: 1 QUART
Additional Data: FILM OR SHEEN UPON THE WATER SURFACE OR DISCOLORATION OF THE WATER OR ADJOINING SHORELINE IS REPORTABLE TO THE NATIONAL RESPONSE CENTER AT 1-800-424-8802.

=====
Detail DOT Information
=====

DOT PSN Code: ZZZ
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
=====

Detail IMO Information
=====

IMO PSN Code: ZZZ
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
=====

Detail IATA Information
=====

IATA PSN Code: ZZZ
IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
=====

Detail AFI Information
=====

AFI PSN Code: ZZZ
AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
=====

HAZCOM Label
=====

Product ID: NAPA AUTOMATIC TRANS FLUID DEXRON II
Cage: 72527
Company Name: VALVOLINE OIL
Street: 3499 DABNEY DRIVE
PO Box: 14000
City: LEXINGTON KY
Zipcode: 40512
Health Emergency Phone: 606-265-7000
Date Of Label Review: 05/17/1994
Status Code: C
MFG Label NO: NONE
Label Date: 05/17/1994
Origination Code: G
Chronic Hazard IND: Y
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: Slight
Reactivity Hazard: None
Hazard And Precautions: MAY CAUSE SLIGHT EYE IRRITATION. PROLONGED OR REPEATED CONTACT MAY BE MILDLY IRRITATING TO THE SKIN AND MAY CAUSE DERMATITIS. INHALATION NOT EXPECTED TO BE A HAZARD AT NORMAL ROOM TEMPERATURES. HOWEVER IF EXPOSURES EXCEED 5 MG/M3 FOR OIL MI ST, THEN RESPIRATORY IRRITATION MAY RESULT. INGESTION MAY CAUSE GI TRACT IRRITAT AVOID CONTACT WITH EYES AND SKIN. DO NOT USE CUTTING OR WELDING TORCH ON THIS CONTAINER (EVEN EMPTY). DO NOT TRANSFER TO UNLABELED CONTAINER. FIRST AID: SKIN: WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION. REMOVE CONTAMINATED CLOTHING AND LAUNDER BEFORE REUSE. EYES: FLUSH WITH

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