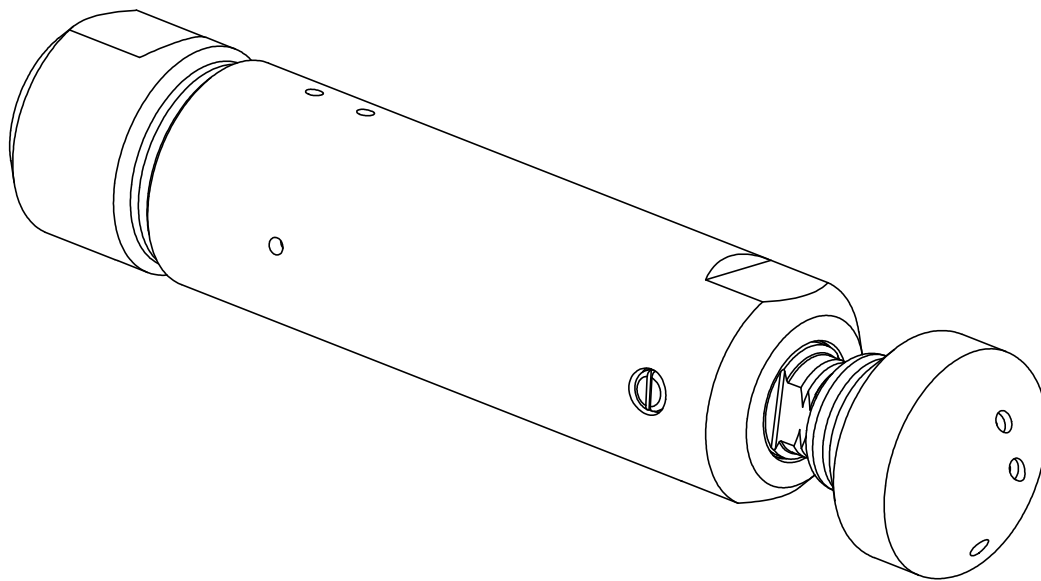


# ROTARY WATERBLAST NOZZLE

# MARTEN

## OPERATION AND MAINTENANCE MANUAL



54 Girard St. Durango, Colorado 81303  
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(970) 259-2869 Phone (970) 259-2868 Fax  
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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](http://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 rigid stinger, anti-withdrawal device, and a foot/hand guard is recommended. Strong thrust is created by waterjets and these forces can become unbalanced if a nozzle should become plugged or hydraulicking occurs.
- 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 If it is necessary to have a person work near the cleaning jets, then it is this person who should have control of the pressure dump mechanism.

### 3.0 DESCRIPTION

The **MARTEN** is a self-rotating high pressure swivel designed for tube and pipe cleaning. It has an outside diameter of 1.25 inches (32 mm). The rotation of fewer, larger jets effectively clean tubes faster and with less streaking. Jet reaction force powers rotation of the head. A thick viscous fluid controls the rotation speed.

The Marten 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 from 5000 to 15000 psi and flow rates up to 25 gpm. At 25 gpm the pressure loss thru the tool is 950 psi. Higher flow rates would create too much pressure loss to be useful. The Marten has a 1/2 NPT female inlet.

Two standard head designs are available; the **Unplugging** head has three forward jets (15, 30 and 45 degrees) and two back jets (135 degrees). The **Polisher** head has six jets at angles of 90 and 100 degrees. Each head is designed for a specific pressure and flow rate, and must be used at the specified pressure to obtain the proper rotation speed. The nozzle heads are wear items that will need to be replaced after 20 to 60 hours, depending on water filtration.

**The most important maintenance item for the Marten is keeping the tool filled with the viscous fluid. This may need to be done as often as every ten hours.** The indication for needing service is a dramatic increase in rotation speed. Refer to the Maintenance Section 6.0.

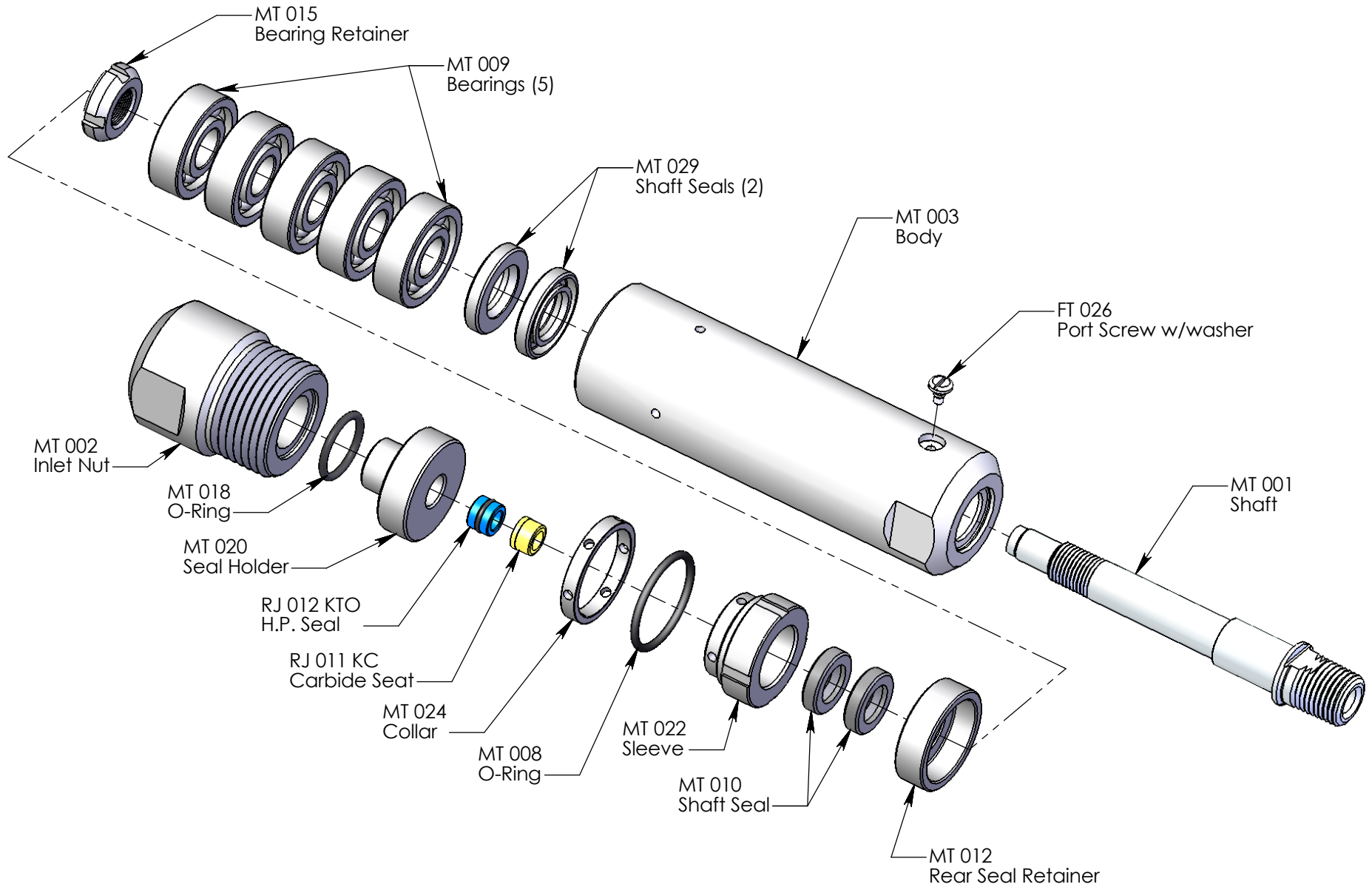
### 4.0 PARTS LIST

<u>Part #</u>	<u>Description</u>	<u>Qty</u>
BJ 048-S	Slow Viscous Fluid	1
FT 026	Port screw/O-ring	1
MT 001	Shaft	1
MT 002	Inlet Nut	1
MT 003	Body	1
MT 008	O-ring	1
MT 009	Bearing	5
MT 010	Shaft Seal	2
MT 012	Rear Seal Retainer	1
MT 015	Bearing Retainer	1
MT 018	O-Ring	1
MT 020	Seal Holder	1
MT 022	Sleeve	1
MT 024	Collar	1
MT 029	Shaft Seal	2
RJ 011 KC	Carbide Seat	1
RJ 012 KTO	H.P. Seal	1

**Also available separately:**

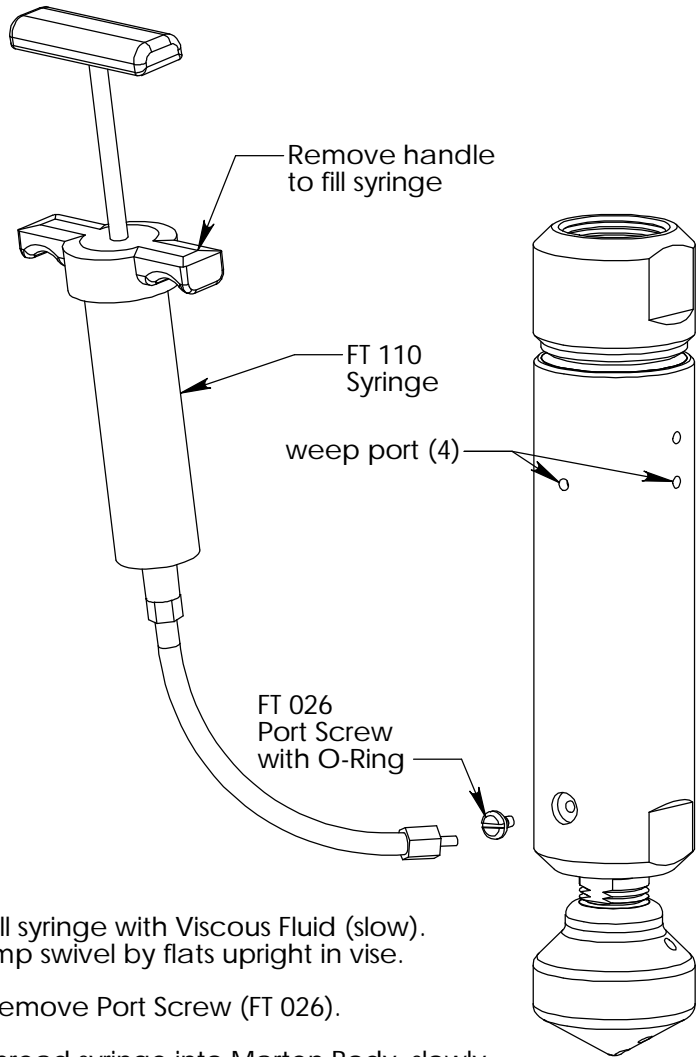
MT 600	Service Kit	(Includes items needed for maintenance)
MT 602	Seal Kit	(Includes parts needed for one seal change)
MT 610	Overhaul Kit	(Includes parts needed for tool rebuild)
MT 612	Tool Kit	(Includes tools to aid assembly)

# MARTEN EXPLODED ASSEMBLY DRAWING

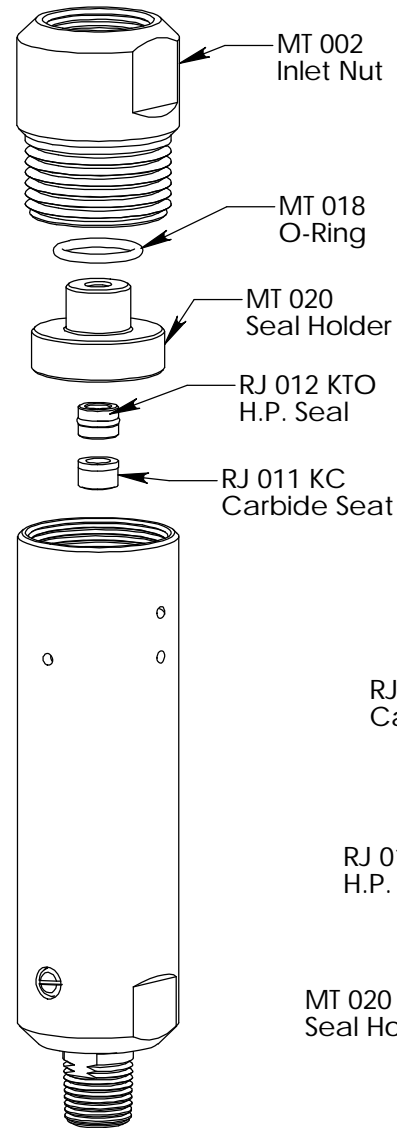


## 6.0 VISCOUS FLUID AND HIGH PRESSURE SEAL MAINTENANCE

It is very important that the Marten be kept full of viscous fluid. When the tool begins to dramatically speed up, the fluid should be refilled as shown. This may need to be done as frequently as every 10 hours. If this is not done, the tool will continue to speed up until the bearings fail and need to be replaced.

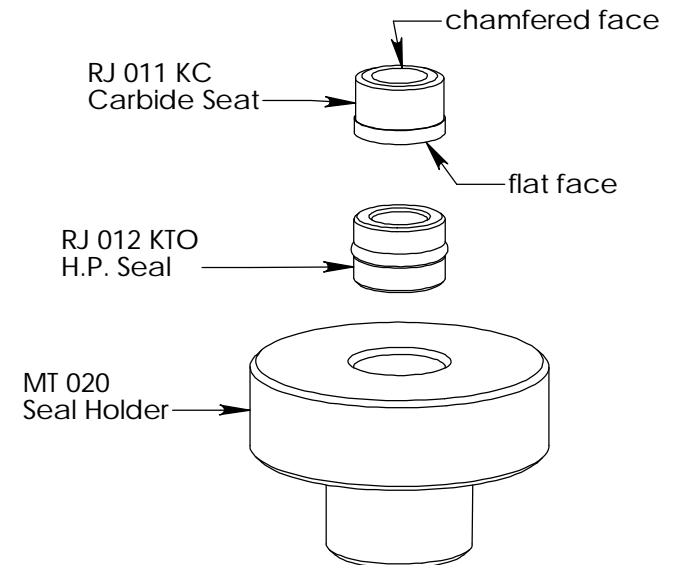


1. Fill syringe with Viscous Fluid (slow). Clamp swivel by flats upright in vise.
2. Remove Port Screw (FT 026).
3. Thread syringe into Marten Body, slowly squeeze a full syringe of fluid into the tool; excess fluid comes out weep ports.
4. Remove syringe and install port screw



To replace High Pressure Seal:

1. Remove the Inlet Nut (MT 002) from the Body.
2. Pull out the Seal Holder (MT 020), O-Ring (MT 018), H.P. Seal (RJ 012 KTO) and Carbide Seat (RJ 011KC).
3. Inspect Carbide Seat for chips or erosion.
4. Apply grease to a new H.P. seal and install in Seal Holder.
5. Apply grease to the flat end of the Carbide Seat, install in Seal Holder with the flat end against the H.P. Seal as shown below.
6. Slide Seal Holder into Body, reinstall O-ring and Inlet Nut. Tighten Inlet Nut with a torque of 50 ft-lb.



## 6.1 MARTEN DISASSEMBLY INSTRUCTIONS

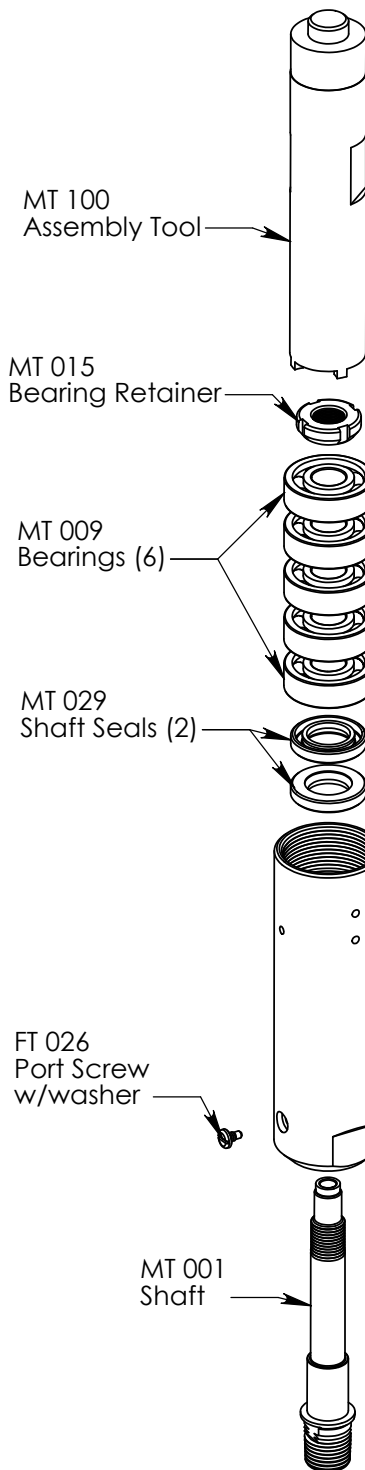
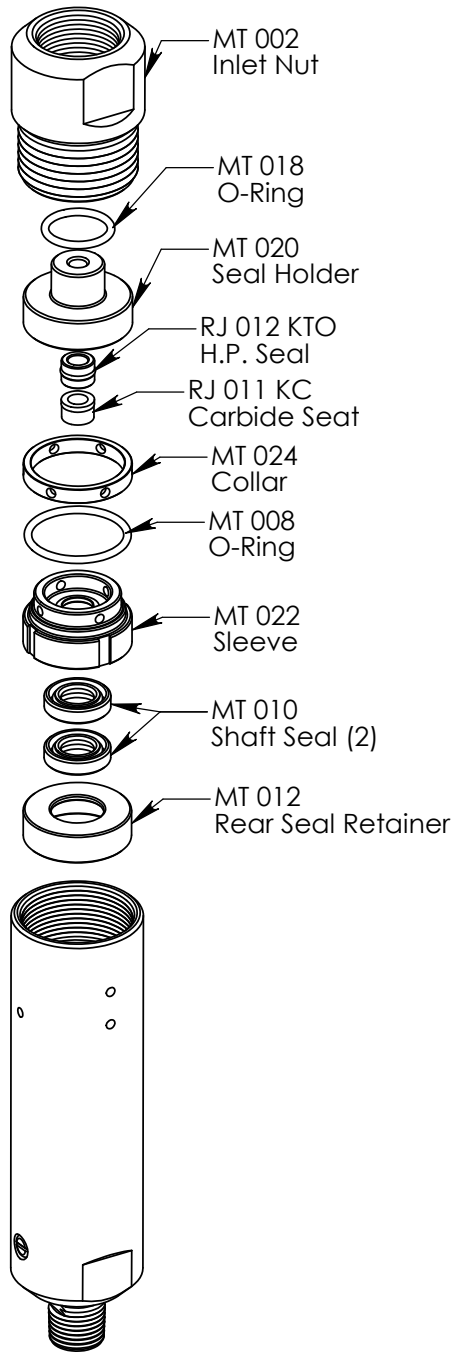
1. Unscrew the Inlet Nut (MT 002) from the Body.

2. Pull out the O-Ring (MT 018), Seal Holder (MT 020), H.P. Seal (RJ 012 KTO) and Carbide Seat (RJ 011 KC).

3. Remove Sleeve (MT 022) using snap ring pliers or a bent wire or nail inserted in one of the holes. Be careful not to damage the end of the shaft. The Collar (MT 024), O-Ring (MT 008) and Shaft Seals (MT 010) will come out with it.

4. Remove the Shaft Seals (MT 010) from the Sleeve.

5. Remove the Rear Seal Retainer (MT 012).



6. Remove the Bearing Retainer (MT 015) using the Assembly Tool (MT 100).

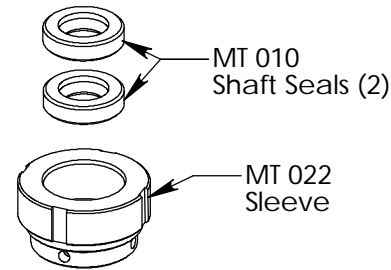
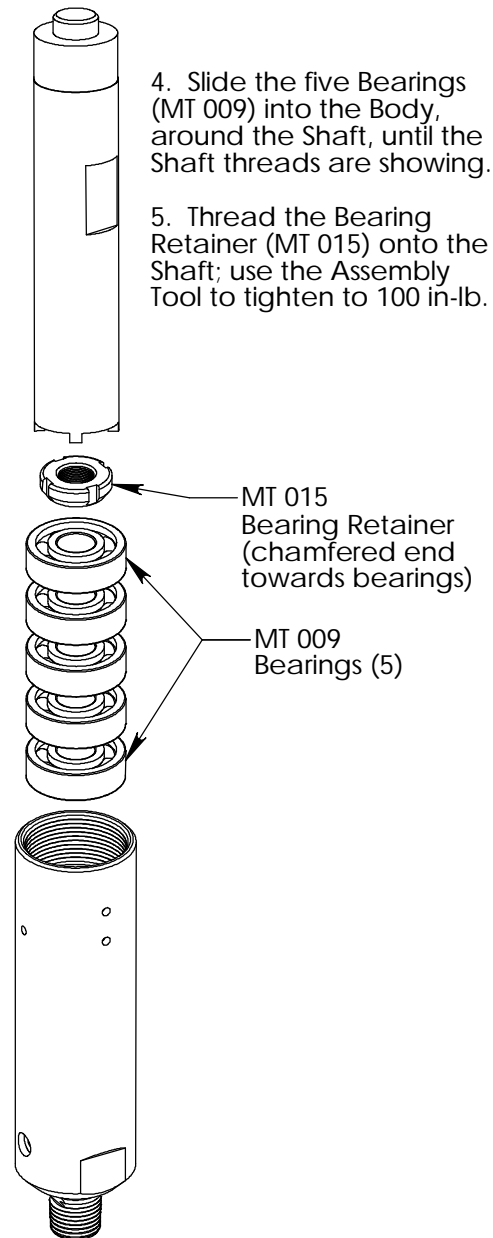
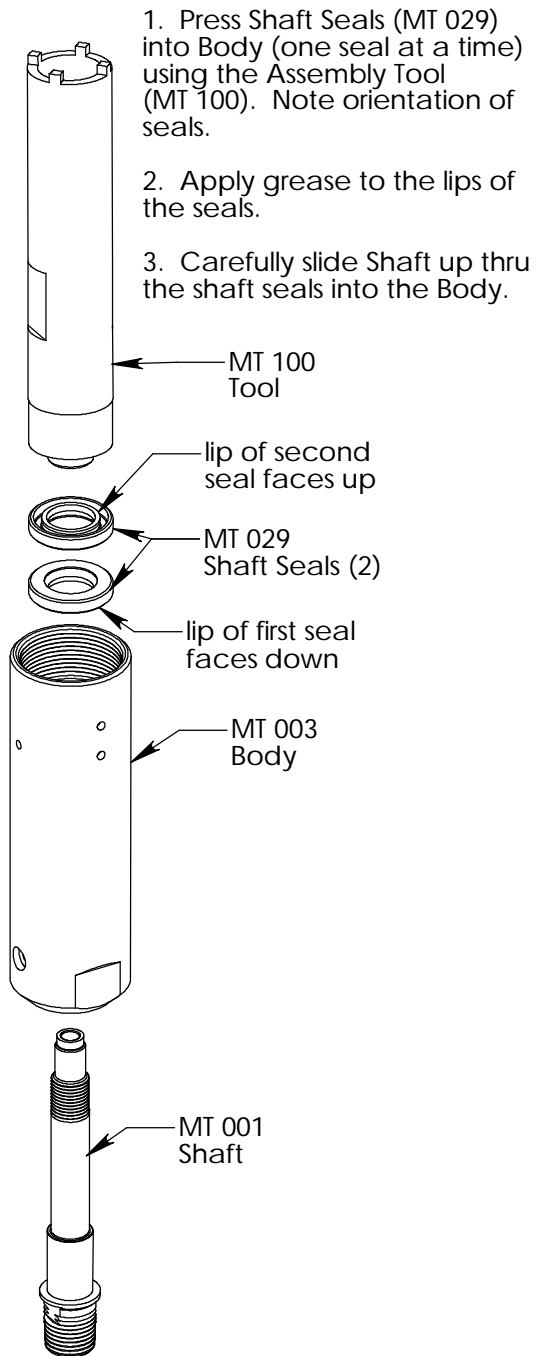
7. Pull Shaft (MT 001) out of Body.

8. Push Bearings (MT 009) out of Body using a  $7/16 \varnothing$  bolt.

9. Remove Shaft Seals (MT 029) from Body.

10. Remove the Port Screw (FT 026).

## 6.2 MARTEN ASSEMBLY INSTRUCTIONS



8. Insert the Rear Seal Retainer (MT 012) into the Body; push down against the Bearings.

9. Install the Sleeve (MT 022) into the Body. The Shaft end should just stick up thru the center.

10. Place the O-Ring (MT 008) and the Collar (MT 024) in the groove around the outside of the Sleeve.

11. Install the H.P. Seal (RJ 012 KTO) and the Seat (RJ 011 KC) in the Seal Holder (MT 020) as shown in Section 6.0. Remember to apply grease to these parts.

12. Install Seal Holder into Body.

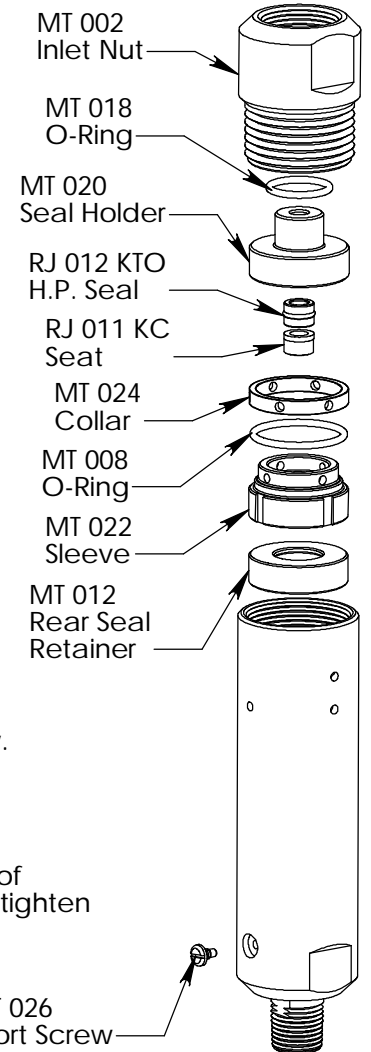
13. Place O-Ring (MT 018) over Seal Holder.

14. Apply anti-seize to threads of Inlet Nut, thread into Body and tighten to 40 ft-lb.

15. Use Syringe to fill Marten with viscous fluid; install Port Screw (FT 026). Refer to Section 6.0.

6. Install the Shaft Seals (MT 010) into the Sleeve. The lips of both seals are facing down into the Sleeve in this view.

7. Apply grease to the lips of the seals.



## 6.3 TROUBLESHOOTING GUIDE

<u>SYMPTOM</u>	<u>PROBLEM</u>	<u>SOLUTION</u>
Rotates too fast	<ol style="list-style-type: none"><li>1. Loss of viscous fluid</li><li>2. Too much power</li></ol>	<ol style="list-style-type: none"><li>1. Refill viscous fluid</li><li>2. Use head properly drilled for pressure</li></ol>
Will not rotate	<ol style="list-style-type: none"><li>1. Not enough power</li><li>2. Bad bearings</li></ol>	<ol style="list-style-type: none"><li>1. Use head properly Drilled for pressure</li><li>2. Replace bearings</li></ol>
Leaks out weep holes	<ol style="list-style-type: none"><li>1. Worn or missing H.P. seal</li><li>2. Worn or damaged Seat</li><li>3. Damaged shaft end</li></ol>	<ol style="list-style-type: none"><li>1. Replace H.P. Seal</li><li>2. Replace Seat</li><li>3. Face or replace Shaft.</li></ol>
Seals wear out quickly	<ol style="list-style-type: none"><li>1. Worn or damaged seat</li><li>2. Seal Holder ID worn</li></ol>	<ol style="list-style-type: none"><li>1. Replace Seat</li><li>2. Replace Seal Holder</li></ol>



## **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 BJ 048-S VISCOUS FLUID

OSI SPECIALTIES INC — POLYDIMETHYLSILOXANE L-405-12500  
MATERIAL SAFETY DATA SHEET Revision: 1.0 9/27/2000

## MSDS Safety Information

MSDS Date: 9/27/2000  
MSDS Num: 91000000791  
Product ID: L-405-12500  
Chemical Name: Polydimethylsiloxane(inhibited)  
Responsible Party: Mr. Dana Dalrymple  
Name: OSI SPECIALTIES INC  
Address: ONE AMERICAN LANE  
City: GREENWICH CT 06831-2559  
Info Phone Number: 304-652-8446  
Emergency Phone Number: 800-809-9998; 800-424-9300(CHEMTREC)  
Published: Y

## Ingredients

Proprietary: NO  
Ingredient: POLYDIMETHYLSILOXANE  
Ingredient Sequence Number: 01  
Percent: <100%  
CAS Number: 63148-62-9  
Other Recommended Limit: NONE SPECIFIED

Proprietary: NO  
Ingredient: PROPRIETARY inhibitors  
Ingredient Sequence Number: 02  
Percent: <1%  
Trade secret

## Health Hazards Data

LD50-LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN  
Route Of Entry - Inhalation: NO  
Route Of Entry - Skin: NO  
Route Of Entry - Ingestion: NO  
Health Haz Acute And Chronic: ACUTE & CHRONIC: NO EVIDENCE OF ADVERSE FROM AVAILABLE INFORMATION.  
Carcinogenicity - NTP: NO  
Carcinogenicity - IARC: NO  
Carcinogenicity - OSHA: NO  
Signs/Symptoms Of Overexp: No Adverse Effects.  
Med Cond Aggravated By Exp: None Specified By Manufacturer.  
Emergency/First Aid Proc:  
INGESTION: NO EMERGENCY CARE ANTICIPATED.  
SKIN:WASH WITH SOAP AND WATER.  
INHALATION: NO EMERGENCY CARE ANTICIPATED.  
EYES: FLUSH THOROUGHLY WITH WATER FOR SEVERAL MINUTES.  
NOTES TO PHYSICIAN: THERE IS NO SPECIFIC ANTIDOTE. TREATMENT OF OVEREXPOSURE SHOULD BE DIRECTED AT THE CONTROL OF SYMPTOMS AND THE CLINICAL CONDITION OF THE PATIENT

## Handling and Disposal

## Fire and Explosion Hazard Information

Flash Point: 254°C/(490°F)  
Extinguishing Media: DO NOT SPRAY A SOLID STREAM OF WATER DIRECTLY INTO BURNING LIQUID.  
USE CARBON DIOXIDE, ALCOHOL FOAM, OR DRY CHEMICAL.  
Special Fire Fighting Proc: WEAR SELF CONTAINED BREATHING APPARATUS.  
CONTAIN RUNOFF.  
Unusual Fire And Expl Hazrds: MAY CAUSE FLOATING FIRE HAZARD

## Control Measures

Respiratory Protection: NONE EXPECTED TO BE REQUIRED.  
Protective Gloves: 4H, BUTYL, NEOPRENE, NITRILE(NBR), PVC COATED  
Eye Protection: SAFETY GLASSES  
Work Hygienic Practices: OBSERVE GOOD PERSONAL HYGIENE PRACTICES AND RECOMMENDED PROCEDURES. DO NOT WEAR CONTAMINATED CLOTHING OR FOOTWEAR.  
Other Protective Equipment: SAFETY SHOWER, EYE BATH

Physical/Chemical Properties

Appearance:  
Physical state: Clear to Hazy Liquid  
Color: Yellow  
Odor: Mild  
Other Properties:  
Boiling Point: >250°C @STP unless specified below  
Melting Point: <-50°C @ STP unless specified below  
pH: N/A  
Spec Gravity: 0.9738@25°C  
Vapor Pres: <1.33hPa (1.00mmHg) @20°C  
Vapor Density: Heavier Than Air  
Solubility in Water: Insoluble  
Evaporation Rate: <1  
Flash Point: >254°C / >490°F  
Upper Explosion Limit: N/A  
Lower Explosion Limit: N/A  
Percent Volatile: Not Determined  
Molecular Weight: Polymer

Reactivity Data

Stability: Stable  
Stability Condition To Avoid: None Known.  
Materials To Avoid: Strong oxidizing agents  
Hazardous Combustion Products:  
Burning Can Produce The Following Combustion Products:  
OXIDES OF CARBON, OXIDES OF SILICON, FORMALDEHYDE, CARBON MONOXIDE IS  
HIGHLY TOXIC IF INHALED; CARBON DIOXIDE IN SUFFICIENT CONCENTRATIONS CAN  
ACT AS AN ASPHYXIANT.  
ACUTE OVEREXPOSURE TO THE PRODUCTS OF COMBUSTION MAY RESULT IN  
IRRITATION OF THE RESPIRATORY TRACT.  
Hazardous Polymerization: Will Not Occur.  
Conditions To Avoid Polymerization: None Known.

Toxicological Information

No information relevant to human health hazard evaluation is currently available

Ecological Information

Prevent Runoff  
Use Absorbent To Clean Up

MSDS Transport Information

This product is not regulated by the DOT, IMDG, ICAO.  
Freight description road: OIL, O/T PETROLEUM, LUBRICATING, NOIBN

Regulatory Information

CERCLA; None  
SARA; None  
MSL; None  
EPA; None  
California Prop 65; None  
California SCAQMD; VOC=>0.5mmHg@ 104°C / 219.2°F \*\*Not determined\*\*

Other Information

Chemical Inventory  
Europe: The ingredients of this mixture are on the EINECS inventory.  
United States: The ingredients of this product are listed on the TSCA  
inventory or are exempt.

HAZCOM Label

Product ID: POLYDIMETHYLSILOXANE L-45-12500  
Supplier: Crompton Corporation  
Street: One American Lane  
City: Greenwich, CT  
Zipcode: 06831-2559, USA  
Health Emergency Phone: 800-809-9998;800-424-9300(CHEMTREC)  
Label Required: Yes  
Health Hazard: 0  
Flammability: 1  
Reactivity: 0  
PPE: X