

# SA 1940 Air Powered Rotary Hand Lancing Tool

## Description:

The SA 1940 is an air powered rotary tool for high pressure fluids use. It can apply the power of water jets to drilling or cleaning jobs.

The tool is designed to be used with all common waterblast pumps and compressed air systems. The unit consists of two main components: the air motor and the water swivel. The tool can be used with all standard lance rods and nozzle tips. Special cutting bits with jets are available.

The input port for the SA 1940 is Female Autoclave Engineering 9/16 High Pressure.

The output shaft for the SA 1940 is Male Autoclave Engineering 9/16 High Pressure. Couplings for the SA 1940 are available to fit 3/8 and 9/16 High Pressure lances.

A 1/8" NPT air port on the bottom of the air motor is provided for customer to install a trigger-actuated pilot air signal. This port provides 20 psi minimum; an additional pneumatic control valve may be required to operate a tumble box dump valve.

## Maintenance:

This tool has been designed to require a minimum amount of attention by the operator. However, some guidelines should be followed to obtain top performance and a long, useful life.

This tool is capable of fairly high rpm, but it is recommended that a valve be installed in the airline to regulate the top speed. For many applications lower rpm may improve performance. It will definitely be easier on the motor and swivel.

Refer to the UHS Manual for more detailed information on swivel maintenance.

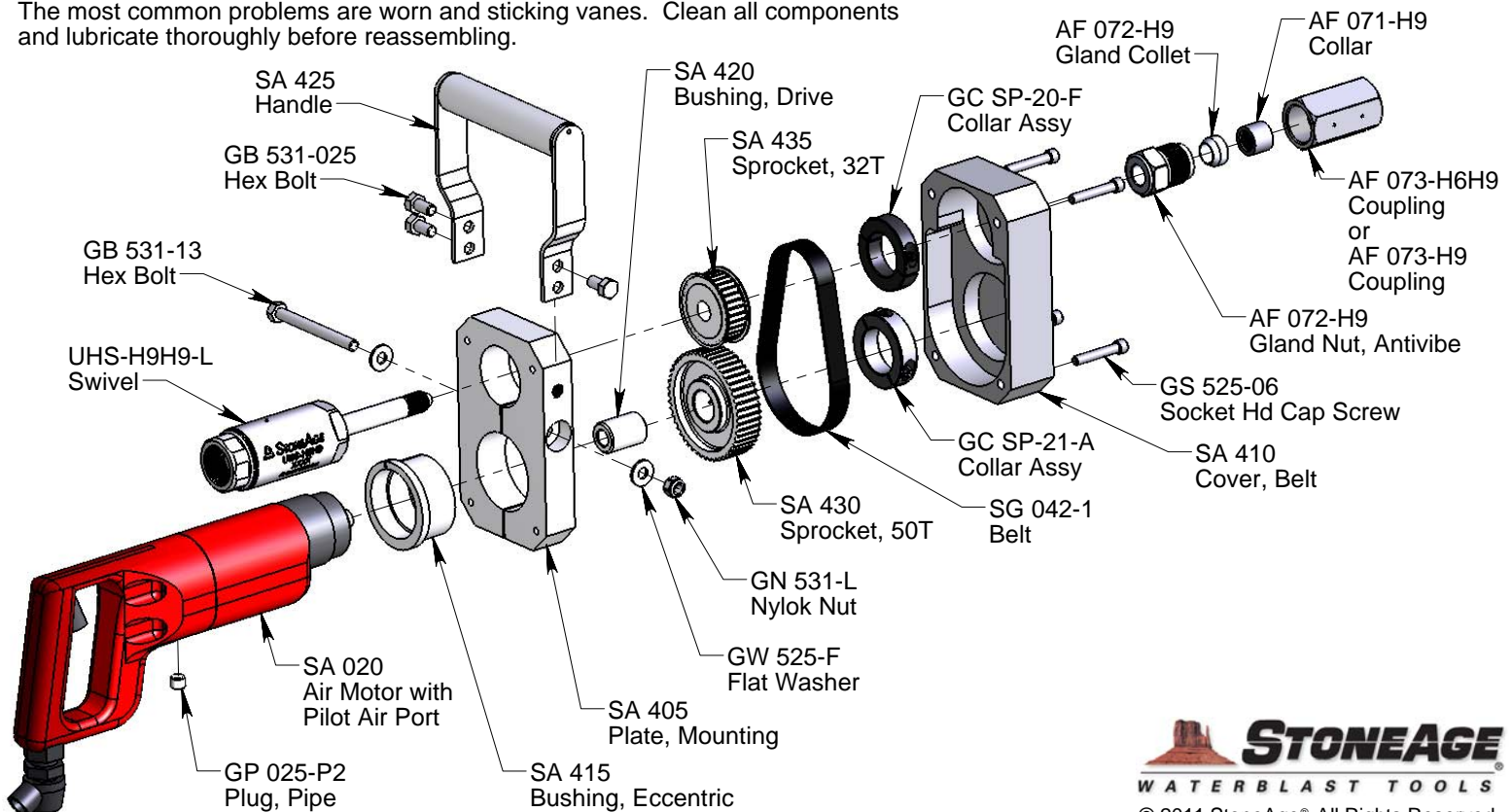
### DRIVE BELT REPLACEMENT

1. Remove the four bolts holding the aluminum cover to the mounting plate.
2. Separate halves. It may be necessary to loosen the clamp bolt on the side of the mounting plate in order to loosen the drive belt by pivoting the eccentric on the motor. Loosen the collar in front of the swivel sprocket and remove the collar, sprocket & drive belt. Inspect sprockets for foreign material buildup.
3. Place new drive belt over swivel sprocket and motor sprocket and slide the swivel sprocket back onto the swivel shaft. Place the clamp collar back on the swivel shaft and tighten, taking care to insure that the belt is centered on the motor sprocket.
4. If necessary, adjust belt tension by pivoting the motor eccentric and re-tighten the clamp bolt.
5. Remount the cover to the mounting plate and tighten the four bolts to hold the halves together.

### AIR MOTOR

1. The air supply should be filtered and use a line oiler to supply lubrication.
2. For added protection when preparing to store the tools, pour a few ounces of oil or diesel directly into the port and run briefly.
3. Keep the control handle clean and working properly.
4. Always blow out the airline before connecting hardware.

Repairs to the air drill are straight forward and require only standard metric wrenches. The most common problems are worn and sticking vanes. Clean all components and lubricate thoroughly before reassembling.





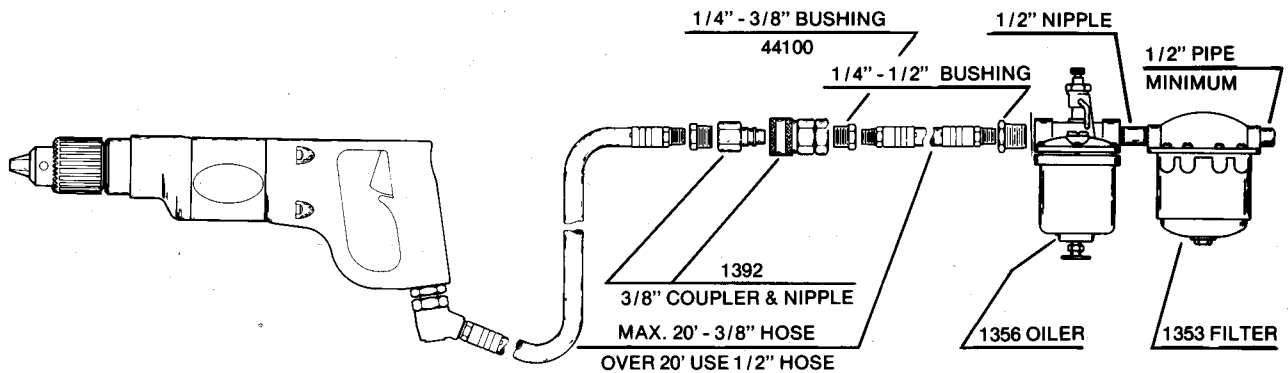
**SIoux  
TOOLS INC.**

2901 FLOYD BOULEVARD ■ SIOUX CITY, IOWA 51102 ■

Form A221  
Dated 11/89

## INSTRUCTIONS

For No's. 1464, 1465, 1466, 1467  
**SIoux 3/8" & 1/2" AIR DRILLS**



### AIR SUPPLY

The tool is designed to operate at approximately 90 pounds per square inch air pressure at the inlet. A 7½ h.p. compressor at 100 lbs. per sq. in. with an air tank of 60 gal. or larger is recommended. Pipe and fittings should be a minimum of ½ inch diameter. The above illustration gives additional information. Note that hose fittings must have inlet holes 9/32 inch or larger. The tool is designed for use with filter and lubricator.

### LUBRICATION

Fill the lubricator with Sioux No. 288 Air Motor Oil and set lubricator to 1-2 drops per minute. The gear case is filled with ½ oz. of Sioux No. 1207 Grease. Replace grease if necessary after 100 hrs. of operation.

### PLACING TOOL IN OPERATION

Drain water from the air compressor and blow condensation from the air lines before each day's operation.

Place 20 to 30 drops of Sioux No. 288 Air Motor Oil into the ⅜ inch inlet hose before using and twice daily thereafter.

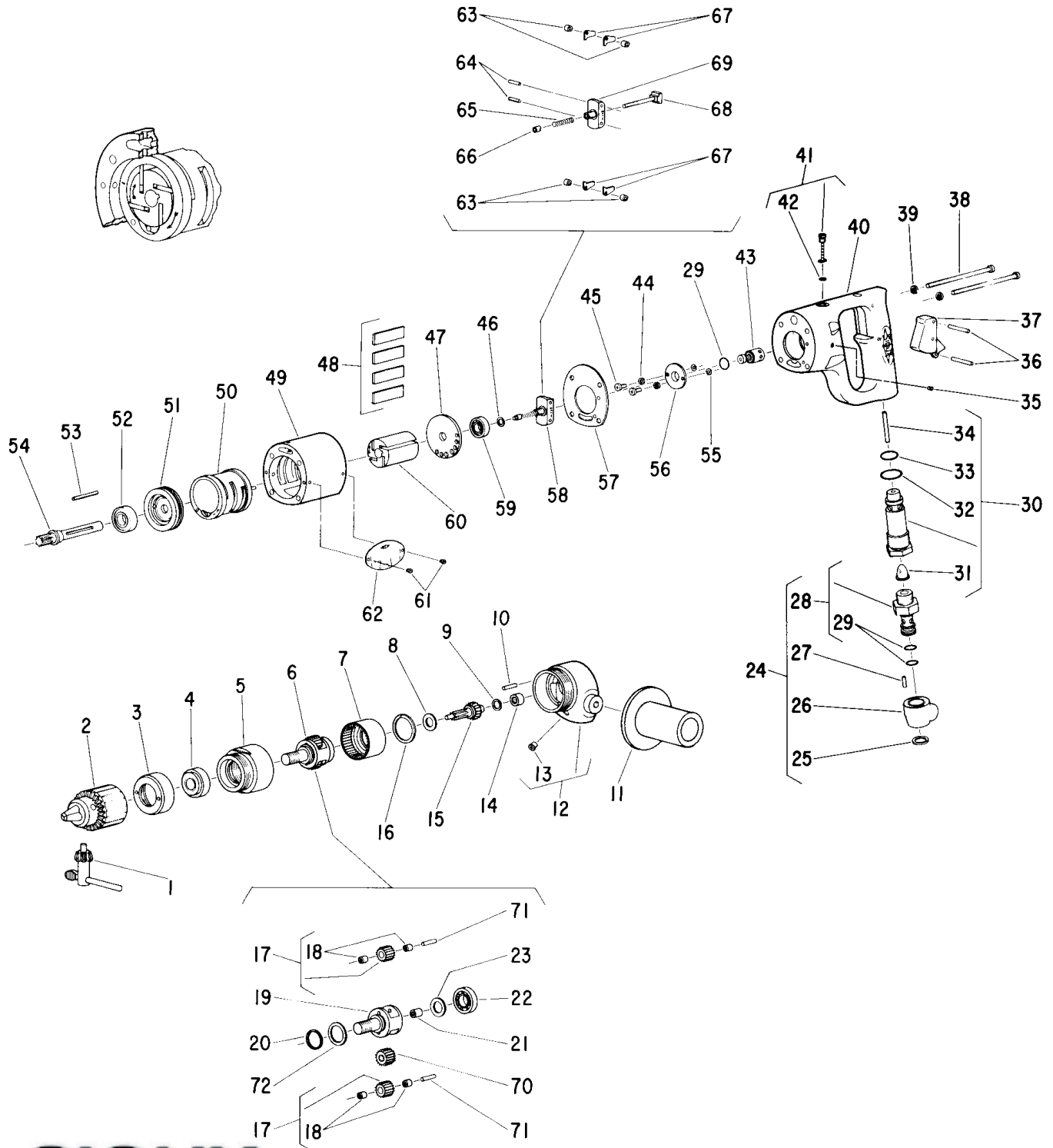
### LOSS OF POWER

- Filter and inlet screen clogged.
- Use of fittings with too small an inlet.
- Use of an undersize hose.
- Loss of air pressure.
- Dirt in the tool.
- Tool not lubricated.
- Stuck governor.
- Worn motor parts (vanes, end plates, cylinder) vanes worn to 13/32 inch in depth should be replaced.



# PARTS LIST FOR 1464, 1465, 1465-1/2, 1466, & 1467 AIR DRILL

(SERIAL 11221 UP TO B)  
(SERIAL B100 & UP)



# SIoux TOOLS INC.

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# PARTS LIST FOR

## 1464, 1465, 1465-1/2, 1466, & 1467 AIR DRILL

(SERIAL 11221 UP TO B)  
(SERIAL B100 & UP)

Fig. No.	Part No.	Description
1.	30011	Key-Chuck
2.	21002	Chuck-3/8" Capacity (1465)
	21137	Chuck-1/2" Capacity (1464, 1465-1/2, 1466, 1467)
3.	44493	Retainer
4.	10198	Bearing-Ball
5.	44494	Support-Spindle
6.	43327	Ass'y-Planetary Gear (1465, 1466,1467)
	63583	Ass'y-Planetary Gear (1464)
7.	19197	Gear-Ring
8.	35128	Washer
9.	35134	Washer
10.	30467	Pin
11.	63349	Ass'y-Side Handle
12.	12299	Case-Gear
13.	30356	Fitting-Grease
14.	10042	Bearing-Needle
15.	19461	Gear & Pinion (1465)
	19462	Gear & Pinion (1466, 1467)
	19493	Gear & Pinion (1464)
16.	21531	Ring-Lock
17.	19324	Ass'y-Gear & Bearing (2)*(1465, 1466, 1467)
	19325	Ass'y-Gear & Bearing (2)*(1464)
18.	10028	Bearing-Needle (4)*
19.	22640	Spindle-Chuck (1465, 1466, 1467)
	64184	Spindle-Chuck (1464)
20.	21524	Ring-Retaining (Used on Some Models)
	21753	Ring-Retaining (1464)
21.	10044	Bearing-Needle
22.	10203	Bearing-Ball
23.	25976	Washer
24.	43133	Ass'y-Swivel
25.	21523	Ring-Retaining
26.	13201	Swivel
27.	34819	Pin
28.	43334	Ass'y-Swivel Body
29.	14312	Ring-"O" (3)*
30.	33998	Ass'y-Throttle Valve
31.	33993	Ass'y-Air Screen
32.	14307	Ring-"O"
33.	14274	Ring-"O"
34.	30424	Pin
35.	30375	Fitting-Grease
36.	30347	Pin (2)*
37.	33967	Ass'y-Trigger

Fig. No.	Part No.	Description
38.	07129	Screw (4)*
39.	Q9724	Washer-Lock (4)*
40.	43073	Ass'y-Handle (Incl. Fig. 24-37, 41-45, 55, 56)
41.	44253	Oiler Screw & "O" Ring
42.	14369	Ring-"O"
43.	43664	Ass'y-Governor Valve
44.	09704	Washer-Lock (2)*
45.	06325	Screw (2)*
46.	35067	Washer-Wave
47.	10520	End Plate-Rear
48.	33997	Vane-Rotor (Set of 4)
49.	12276	Housing
50.	33979	Cylinder
51.	10521	Plate-Front End (Up to Ser. No. B)
	10531	Plate-Front End (Ser. No. B -100 & up)
52.	10203	Bearing-Ball (Up to Ser. No. B)
	10228	Bearing-Ball (Ser. No. B -100 & up)
53.	44219	Key-Rotor
54.	22641	Spindle-Rotor (1464, 1465)
	22642	Spindle-Rotor (1466, 1467)
55.	14750	Retainer-Screw (2)*
56.	44245	Retainer-Governor Valve
57.	14751	Gasket
58.	43672	Ass'y-Governor (1464, 1465, & 1466)
	43670	Ass'y-Governor (1467)
59.	10241	Bearing-Ball
60.	44220	Rotor
61.	06000	Screw (2)*
62.	20368R	Plate-Name
63.	44379	Spacer-Governor (1465, 1466, 1464)(4)*
	44218	Spacer-Governor (1467)(4)*
64.	30336	Pin-Roll (2)*
65.	21411	Spring-Governor (Red)(1465, 1466, 1464)
	21416	Spring-Governor (Green)(1467)
66.	13183	Nut-Governor Adjusting
67.	35069	Weight-Governor (1465, 1464, 1466)(4)*(1467)(6)*
68.	43666	Ass'y-Bearing Support & Spindle
69.	44222	Frame-Governor
70.	19206	Gear-Pinion (1464)
71.	30467	Pin (1465, 1466, 1467)(2)*
	30369	Pin (1464)(2)*
72.	35260	Washer (1464)

\*Order Quantity As Required

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AL, AND MODEL NUMBER WHEN  
RING PARTS

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Printed In U.S.A.

# 40 kpsi UHS Swivel (UHS-H9H9, UHS-H9H9-L)

## Description:

The **UHS** swivel was designed to convey high pressure water from a stationary line to a powered rotating or twisting assembly. It is typically used on lancing machines, surface cleaning machines, and hose reels. The swivel requires a torque of 15 to 50 in-lb to overcome the rotational drag of the high pressure seal while operating at working pressure.

The **UHS** swivel is rated for 40,000 psi (2800 bar) working pressure, and a maximum rotation speed of 1500 rpm. It has a flow capacity rating of Cv = .3. To determine pressure loss thru the swivel at a given flow, divide the flow by the Cv and square the result. This is the pressure drop in psi.

A single high pressure seal is used to provide leak free operation. The seal life will vary depending on the rotation speed. Higher rotation speeds result in shorter seal life. The high pressure seal is considered a wear item, and can be replaced easily and inexpensively.

The **UHS** swivel has a 9/16 High Pressure Autoclave female inlet connection, and the outlet has a 9/16 High Pressure Autoclave LH male shaft connection.

<b>Maximum Operating Pressure</b>	40,000 (2800 bar)
<b>Inlet Connection</b>	9/16 HP
<b>Rotation Speed, Max</b>	1,500 rpm
<b>Shaft Connection</b>	9/16 HP
<b>Torque Required</b>	15 - 50 in-lb
<b>Flow Rating</b>	0.3 Cv

## Operation:

If the swivel will be used at rotation speeds above 500 rpm, the swivel should be allowed a 1/2 hour break-in period where the swivel is run at operating pressure, but with a maximum rotation speed of 500 rpm. The swivel should never be rotated without water passing thru.

Use anti-seize on all threaded connections to prevent galling. Grease the swivel whenever the H.P Seal needs replacement, depending on rotation speed and service conditions.

## Troubleshooting:

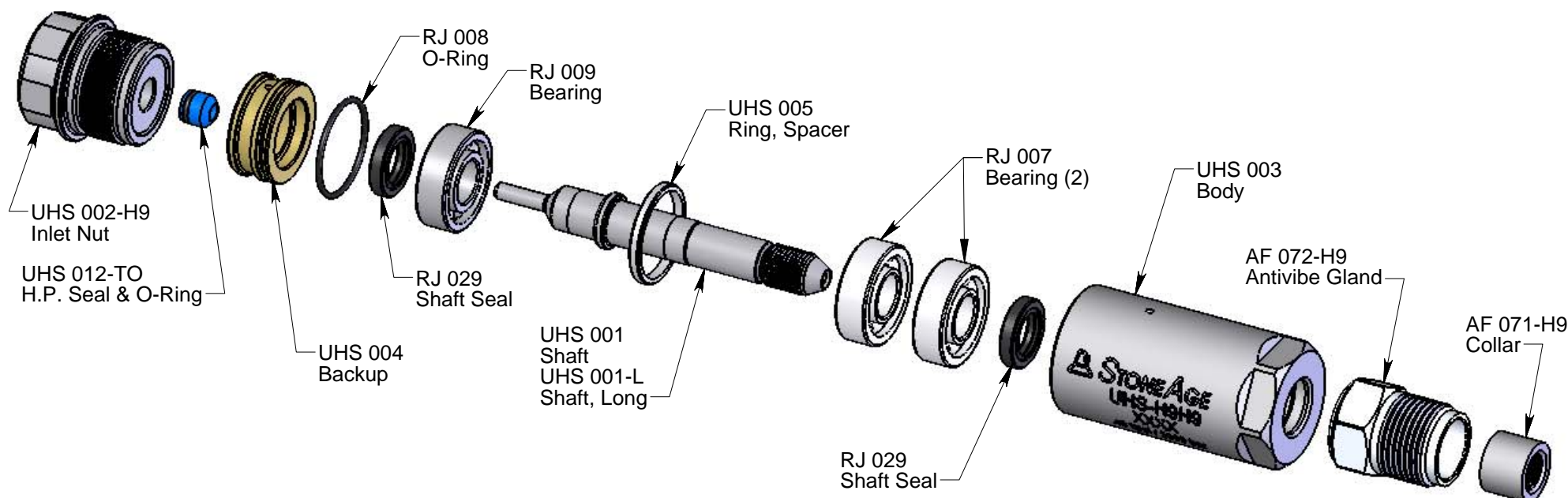
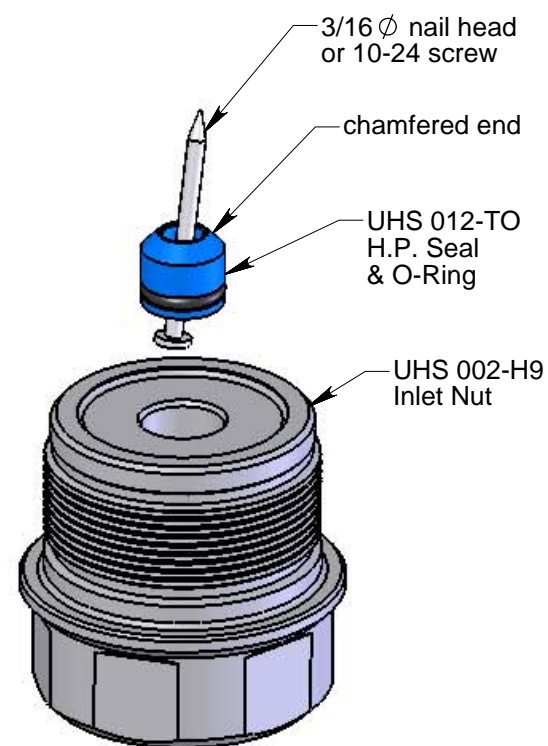
**Seal Leak:** the swivel seal may intermittently leak a little bit. If the leak becomes continuous at operating pressure, the high pressure seal should be replaced.

**Seals wear out quickly:** inspect the portion of the shaft that passes through the bronze backup. If it appears galled, or the inside of the backup is galled, the shaft needs to be lightly polished to remove the bronze buildup (but not polished enough to remove the coating) and the bronze backup needs to be replaced. If seals are wearing quickly but the above has not happened, the bronze backup is worn oversize and needs to be replaced.

## Maintenance: \*Blow out all water with compressed air before storing tool!

### High Pressure Seal Maintenance:

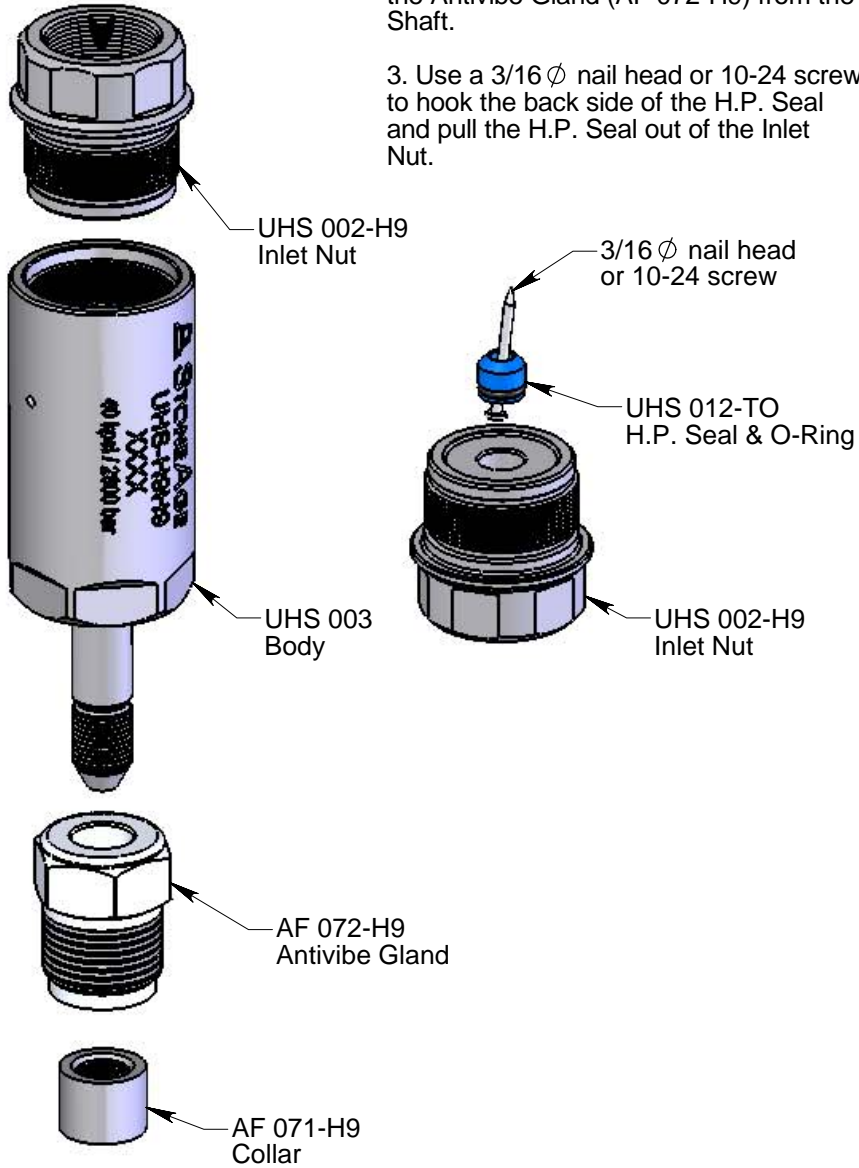
1. Unscrew the Inlet Nut from the Body.
2. The H.P. Seal will likely stay inside the Inlet Nut.
3. Use a 3/16  $\phi$  nail head or 10-24 screw to pull the H.P. Seal out of the Inlet Nut.
4. Apply grease to the outside of a new H.P. Seal, and apply grease to the shaft end where the seal will sit.
5. Push the H.P. Seal into the Inlet Nut, just until flush with face of nut. The chamfered end should face out.
6. Carefully insert the Inlet Nut with H.P. Seal over the end of the shaft and screw it into the body. Tighten to 40 ft-lbs.



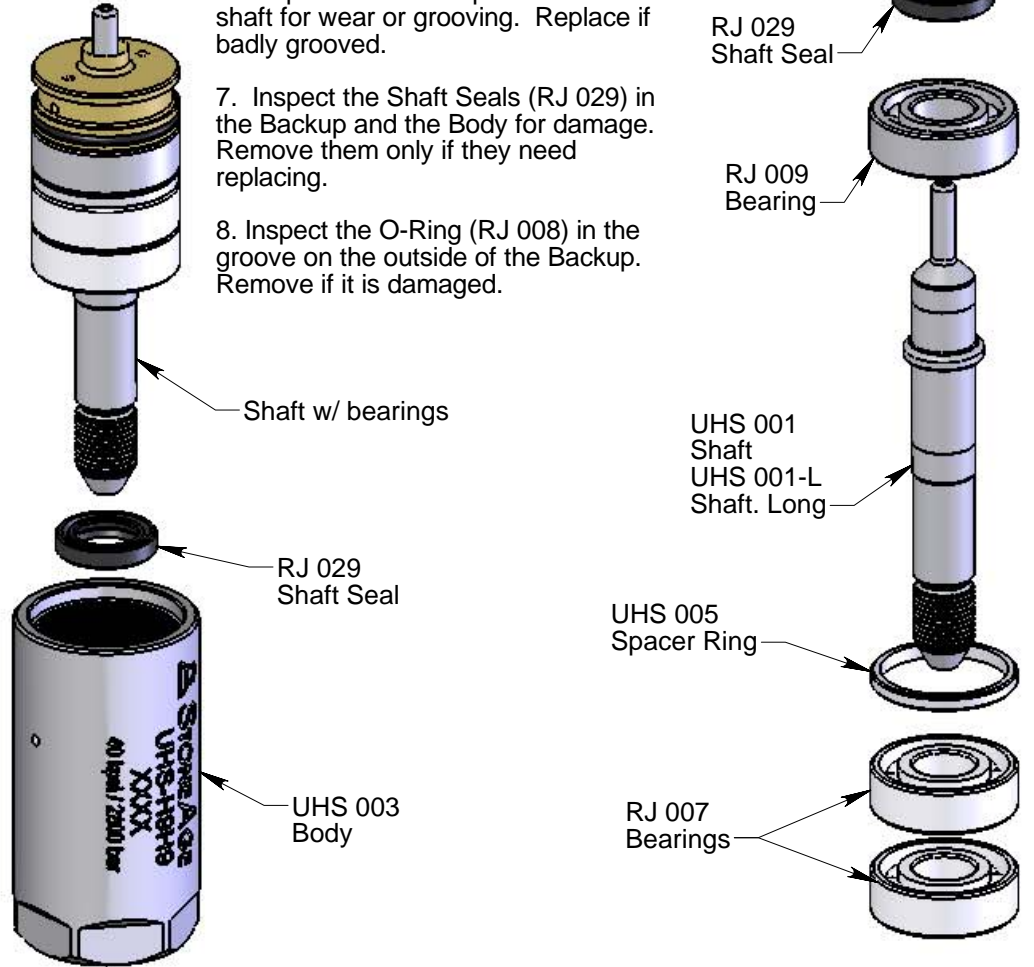
# 40 kpsi UHS Swivel (UHS-H9H9, UHS-H9H9-L)

## Disassembly:

1. Remove the Inlet Nut (UHS 004-H9) from the Body (UHS 003). The High Pressure Seal (UHS 012-TO) will likely stay inside the Inlet Nut.
2. Remove the Collar (AF 071-H9) and the Antivibe Gland (AF 072-H9) from the Shaft.
3. Use a 3/16  $\phi$  nail head or 10-24 screw to hook the back side of the H.P. Seal and pull the H.P. Seal out of the Inlet Nut.



4. Push the Shaft (UHS 001 or 001-L) out of the Body. The bearings should come out with the shaft.
5. Remove the Backup (UHS 004) from the Shaft.
5. Press the bearings (RJ 009 & 2x RJ 007) and the Spacer Ring (UHS 005) off of the Shaft. Be careful not to damage the coated surface of the shaft (the smaller diameter shiny portion).
6. Inspect the coated portion of the shaft for wear or grooving. Replace if badly grooved.
7. Inspect the Shaft Seals (RJ 029) in the Backup and the Body for damage. Remove them only if they need replacing.
8. Inspect the O-Ring (RJ 008) in the groove on the outside of the Backup. Remove if it is damaged.

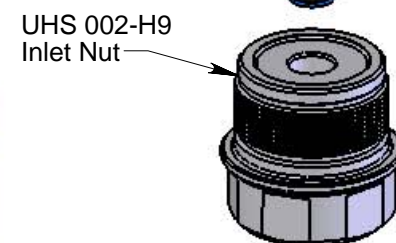
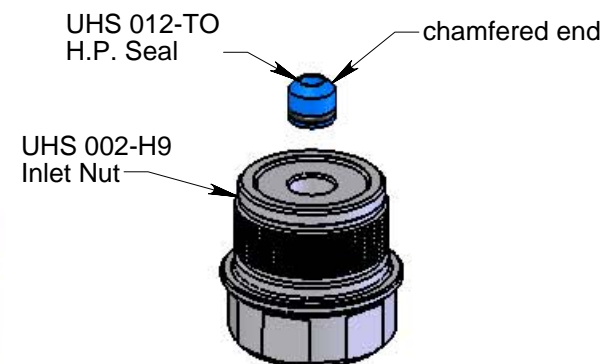
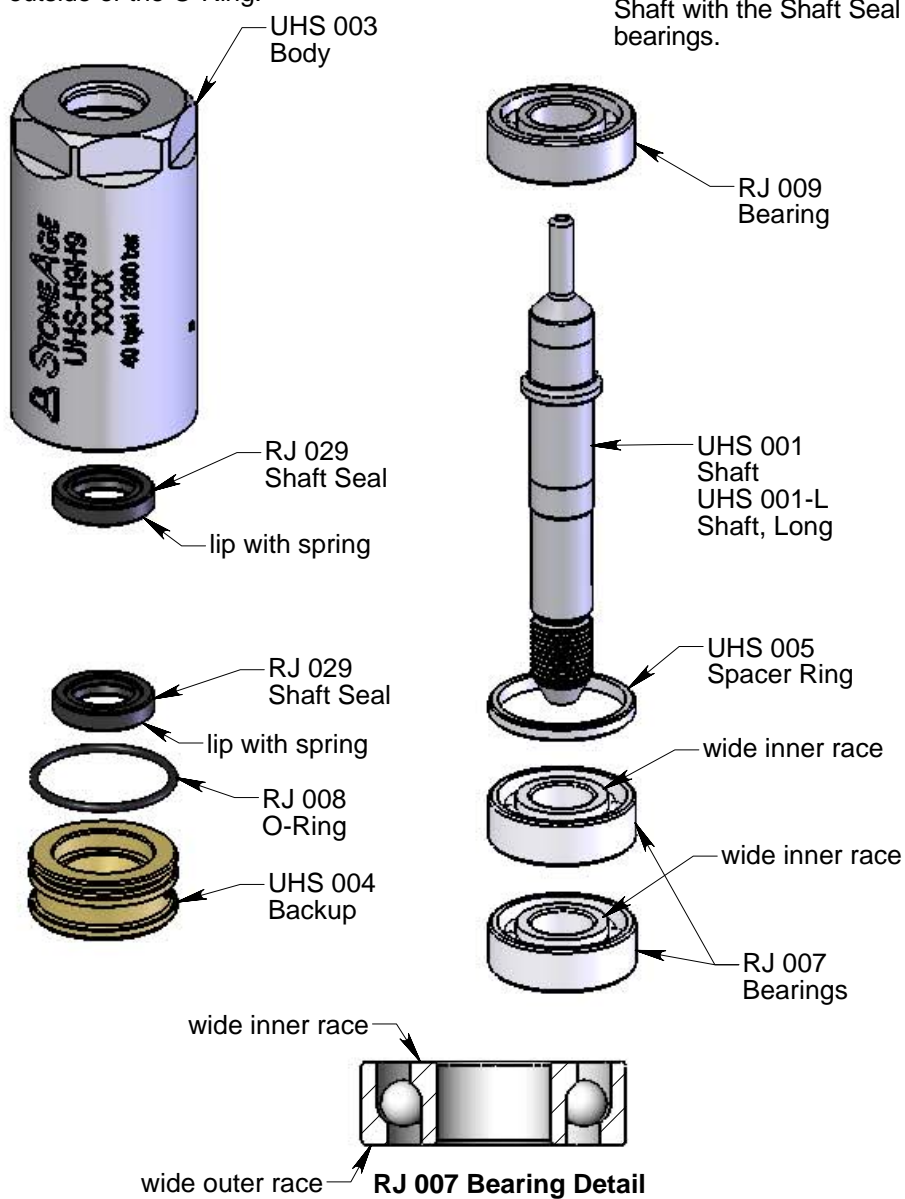


## Assembly:

1. Install Shaft Seal (RJ 029) into the Body. Note the lip with the spring goes in last. Grease the lips of the Seal.
2. Install Shaft Seal (RJ 029) into the Backup. Note the lip with the spring goes in first. Grease the lips of the Seal.
3. Place the O-Ring (RJ 008) into the groove on the outside of the Backup. Grease the outside of the O-Ring.

4. Prior to installation, pack bearings liberally with grease on both sides.
5. Install Bearings (RJ 009 & 2x RJ 007) and Spacer (UHS 005) onto Shaft (UHS 001 or 001-L). Note that the two lower bearings (RJ 007) must be installed with the wide inner race in the correct direction.
6. Carefully slide the Backup onto the Shaft with the Shaft Seal towards the bearings.

7. Gently slide the Shaft assembly with Bearings into the Body.
8. Apply grease to the outside of the H.P. Seal and press into the Inlet Nut, just until flush with face of nut. The chamfered end should face out.
9. Apply grease to the seal surface of the shaft (small diameter).
10. Apply antisieze to the threads on the Inlet Nut. Carefully insert the Inlet Nut with H.P. Seal over the end of shaft and screw it into the Body. Tighten to 40 ft-lbs.
11. Slide Antivibe Gland (AF 072-H9) onto shaft, and screw the Collar (AF 071-H9) on until shaft threads are just visible past the cone of the shaft.



Shaft w/ bearings

