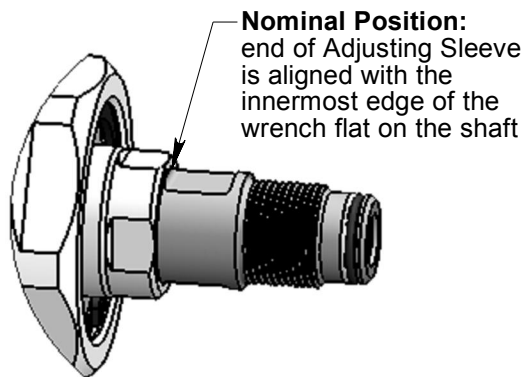


BJV-SC Self-Rotary Swivel with Speed Control (15 or 22 kpsi)

Description:

The BJV-SC with adjustable speed control is available in two configurations. The BJV-SC-P12 has a 3/4 npt female inlet connection and is capable of working pressures up to 15000 psi (1035 bar). The BJV-SC-MP12 has a 3/4" medium pressure female inlet connection and is capable of working pressures up to 22000 psi (1500 bar). Both have flow rates of 15 to 100 gpm. Rotation speed is controlled by a combination of viscous fluid and a speed control adjustment; a thick fluid (BJ 048-S) is used for speed ranges of 5 to 40 rpm, and a thinner fluid (BJ 048-F) is used for speed ranges of 60 to 200 rpm. The fluid in the swivel can be changed to provide the desired range of rotation speed.

The adjustable speed control feature allows for rotational speed adjustment within the speed ranges of the selected viscous fluid. Speed adjustment is accomplished by rotating the adjusting sleeve on the outlet shaft. The nominal setting (where the edge of the sleeve is lined up with the innermost edge of the shaft flats- **see detail**) allows for the fastest rotation speed in the desired range. As the sleeve is adjusted inward towards the swivel body, the rotational speed is reduced. Each 1/2 turn of the sleeve reduces the rotation speed by approximately 5 rpm with slow fluid and about 25 rpm with fast fluid. The maximum sleeve adjustment is 3 turns (about 30 rpm speed reduction with slow fluid and about 140 rpm reduction with fast fluid). When making adjustments, it is recommended to adjust the sleeve about a quarter turn beyond the desired setting and then backing it off a quarter turn, thus allowing the viscous fluid to equalize more uniformly. **Caution:** Care should be taken not to back the sleeve out past the nominal setting, as fluid will escape and the sleeve may work itself loose during operation.



Adjusting Sleeve Detail

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 BJV to hose end. 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. Once the BJV is attached to the hose end, position it in the pipe or vessel to be cleaned. 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 pipe to begin the cleaning job. Allow the jets time to do their work by feeding the hose out at a controlled rate. Once 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 inlet nut as well.

Troubleshooting:

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 replug 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: Check the nozzles sizes and head offset to make sure they are correct; refer to the description section above. If these are correct, it is likely that the swivel is low on viscous fluid, or the viscous fluid has water in it. The best thing to do is drain all the fluid, wipe the parts clean and refill with the proper fluid. Check that the shaft seals are still good and will keep the fluid from leaking out.

Seal Leak: The seal may initially leak at low pressure, but should pop closed as pressure is increased. If operating pressure is reached and the seal is leaking continuously, the high pressure seal may need to be replaced. Refer to the maintenance below.

Seals wear out 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 .633", the shaft will need to be replaced.

Maintenance:

The high pressure seal will need to be replaced when water is leaking continuously out of the weep ports (under the Weep Seal) at or near operating pressure. The viscous fluid should also be checked and filled or replaced during seal maintenance.

1. Remove the Port Screw (BJ 026).
2. Hold Body by flats; unscrew the Inlet Nut (BJ 002-62 or BJK 002-MP12-62).
3. Remove the Seat (MJ 011-C) and H.P. Seal (HC 012-TO) from the bore of the Shaft.
4. Inspect the Seat for chips on the edges and erosion pits on the face. Replace if damaged.
5. Inspect the face of the Inlet Nut where the Seat makes contact for dings, dents or erosion; these must be faced off to stop all leaking.
6. Check the viscous fluid level and condition; if the fluid appears badly contaminated it should be replaced. Otherwise, add fluid to cover the wave springs.

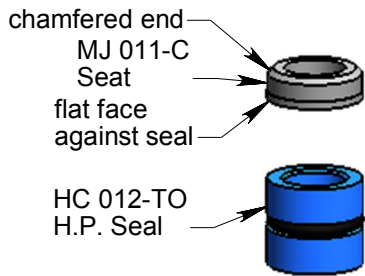
7. Apply grease to a new H.P. Seal and install into bore of shaft. Do not push it all the way in.

8. Install the Seat with the flat side against the Seal (see **detail view**). Push it in just far enough that it will stay in the bore.

9. Apply anti-seize to the threads of the Inlet nut; thread into Body, checking that the Seat stays centered in bore of shaft. Tighten to 60 ft-lb.

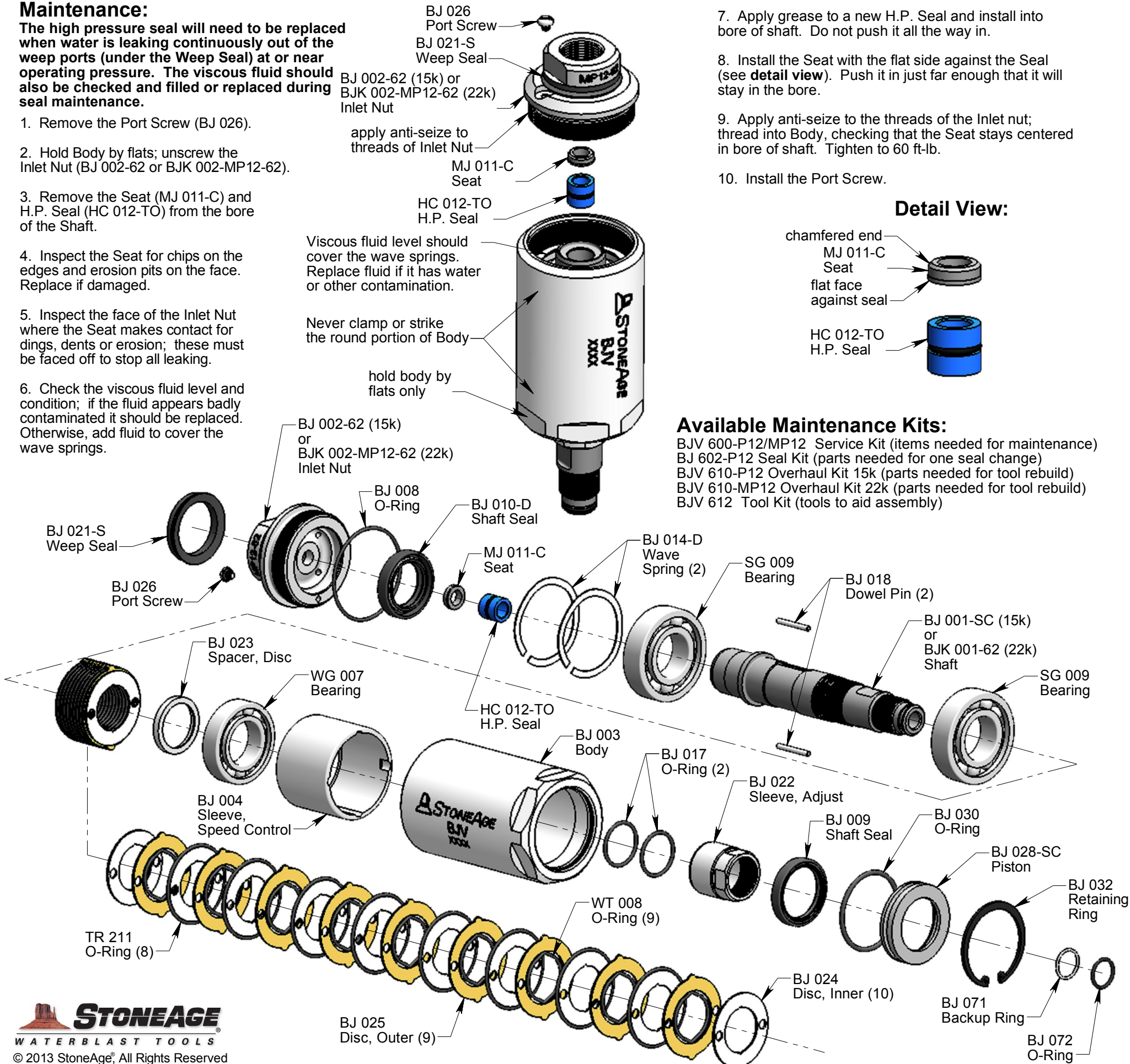
10. Install the Port Screw.

Detail View:



Available Maintenance Kits:

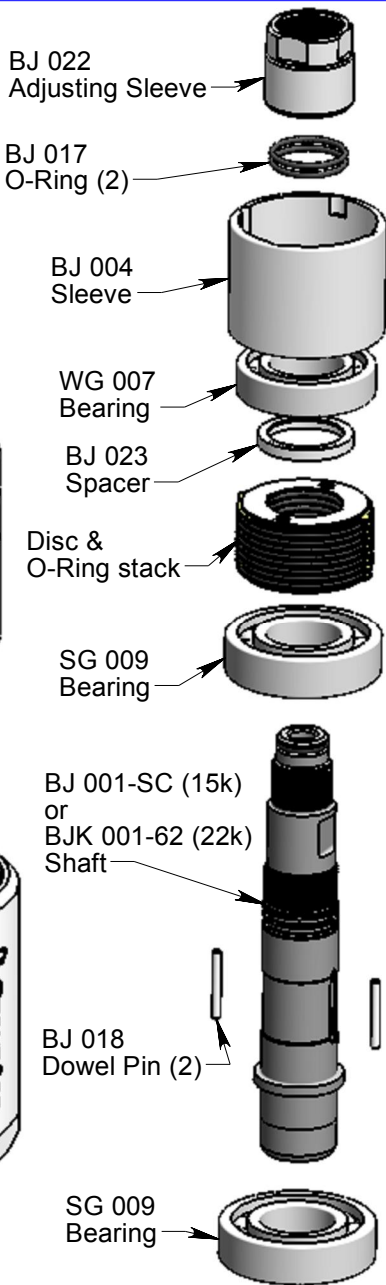
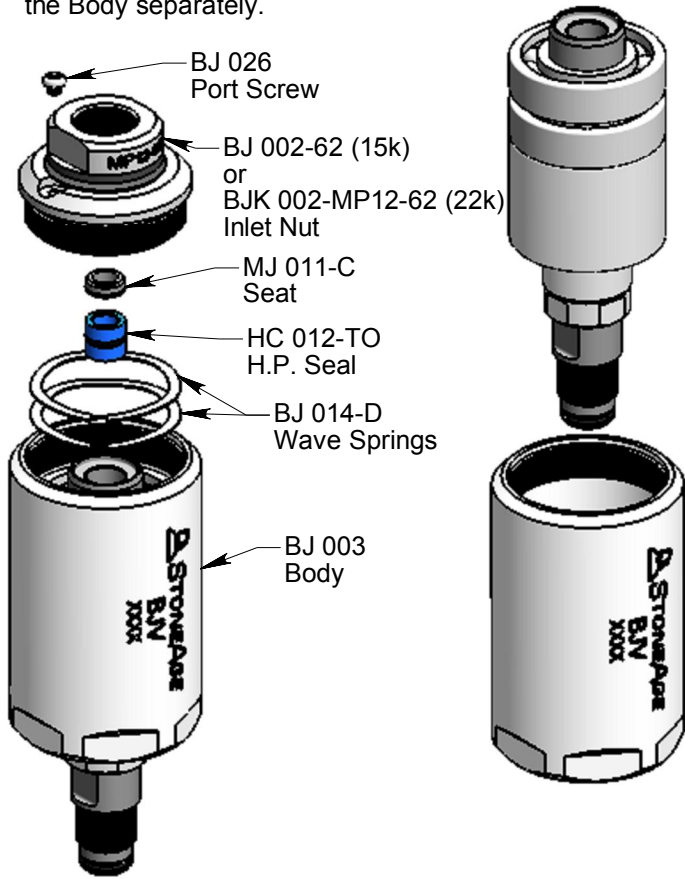
- BJV 600-P12/MP12 Service Kit (items needed for maintenance)
- BJ 602-P12 Seal Kit (parts needed for one seal change)
- BJV 610-P12 Overhaul Kit 15k (parts needed for tool rebuild)
- BJV 610-MP12 Overhaul Kit 22k (parts needed for tool rebuild)
- BJV 612 Tool Kit (tools to aid assembly)



BJV-SC Self-Rotary Swivel with Speed Control (15 or 22 kpsi)

Disassembly:

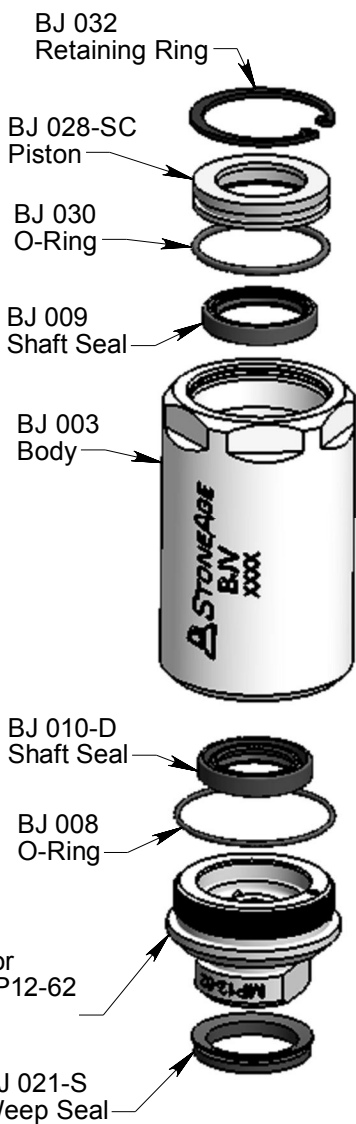
1. Remove the Port Screw (BJ 026) from the Inlet Nut (BJ 002-62 or BJK 002-MP12-62); unscrew the Inlet Nut from the Body (BJ 003).
2. Remove the Seat (MJ 011-C) and H.P. Seal (HC 012-TO) from the bore of the Shaft.
3. Remove the Wave Springs (BJ 014-D).
4. Push the Shaft (BJ 001-62 or BJK 001-62) with bearings and sleeve out of the Body. It may be necessary to remove the Sleeve from the Body separately.



5. Unscrew Adjusting Sleeve (BJ 022) from the end of the Shaft.
6. Remove the Sleeve (BJ 004).
7. Remove the two O-Rings (BJ 017) from the grooves in the shaft.
8. Remove the Bearing (WG 007) and Spacer (BJ 023).
9. Remove the stack of Discs and O-Rings.
10. Press off the remaining Bearings (SG 009) from either side of the shoulder on the Shaft.

11. Remove the Retaining Ring (BJ 032) from the Body. Push out the Piston (BJ 028-SC).
12. Inspect the O-Ring (BJ 030) and the Shaft Seal (BJ 009); replace if damaged.

13. Inspect the O-Ring (BJ 008), Shaft Seal (BJ 010-D) and Weep Seal (BJ 021-S) on the Inlet Nut; replace if damaged.

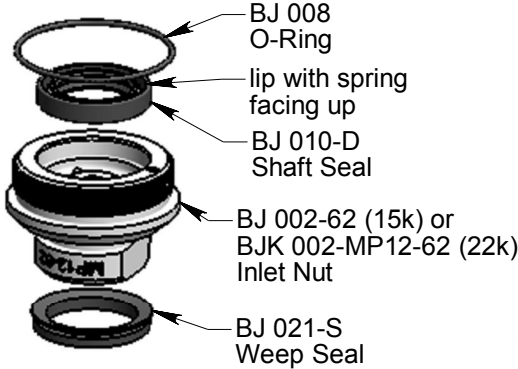


Assembly:

1. Install Shaft Seal (BJ 010-D) in Inlet Nut (BJ 002-SC or BJK 002-62) as shown.

2. Place O-Ring (BJ 008) over threads of Inlet Nut.

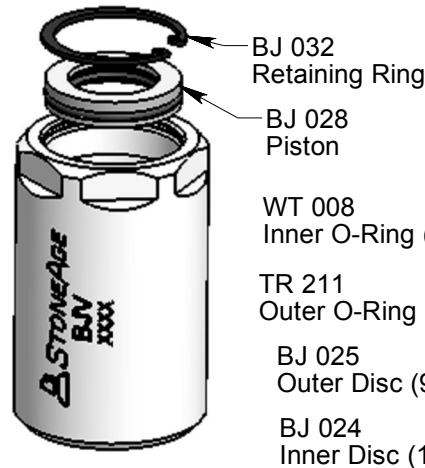
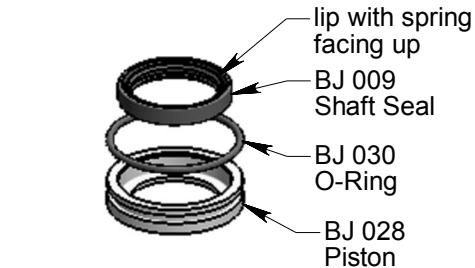
3. Install Weep Seal (BJ 021-S).



4. Install Shaft Seal (BJ 009) in Piston (BJ 028) as shown.

5. Place O-Ring (BJ 030) in groove around Piston.

6. Push Piston into Body (BJ 003), install Retaining Ring (BJ 032).



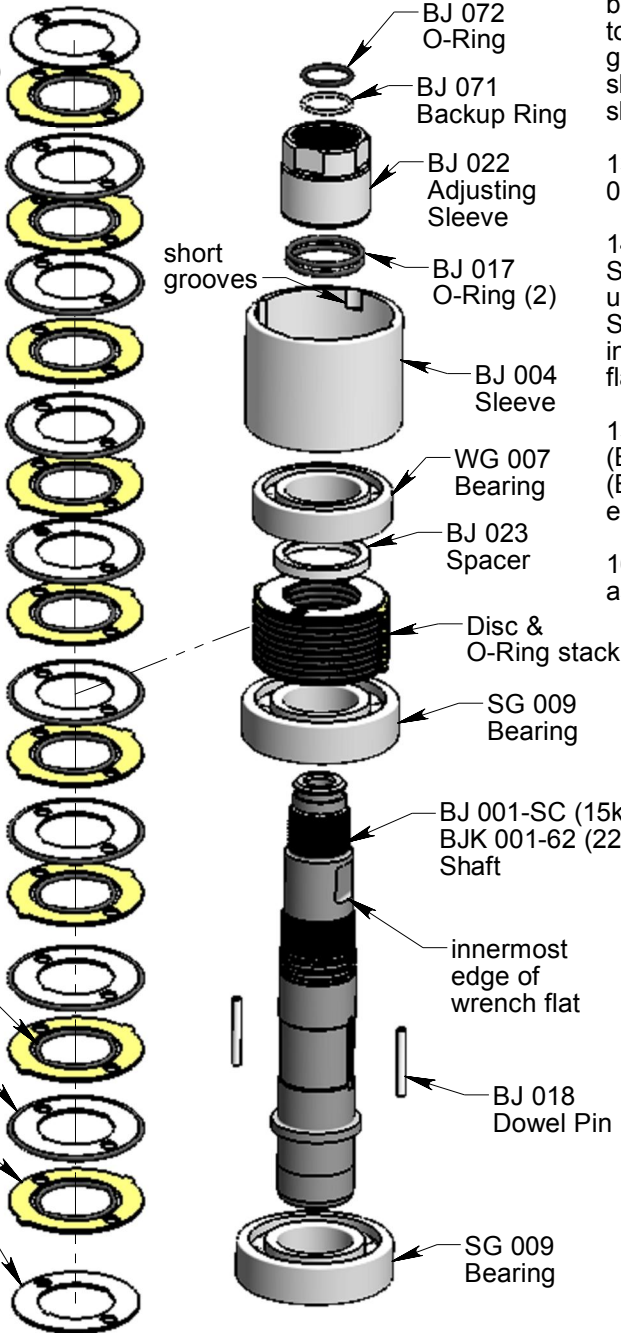
7. Press Bearings (SG 009) onto each side of the shoulder on Shaft (BJ 001-SC or BJK 001-62).

8. Insert Dowel Pins (BJ 018) into slots in Shaft.

9. Begin disc stack on shaft with an Inner Disc (BJ 024). Slip an Inner O-Ring (WT 008) onto Shaft. Stack an Outer Disc (BJ 025) onto Shaft. Add another Inner Disc, and then slip an Outer O-Ring (TR 211) over the OD of the Inner Disc. Continue stacking arrangement as shown using a total of (10) Inner Discs, (9) Outer Discs, (9) Inner O-Rings and (8) Outer O-Rings. No Outer O-Ring is required at either end.

10. Install Disc Spacer (BJ 023) onto shaft with counterbored side towards Discs.

11. Install Bearing (WG 007) onto Shaft.



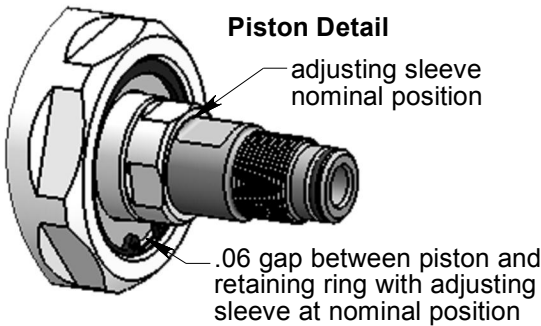
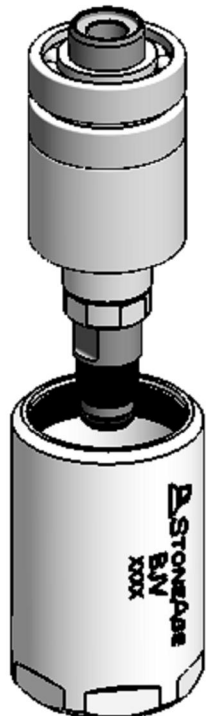
12. Install Sleeve over bearings and discs taking care to align outer disc tabs in grooves of Sleeve. The two short grooves in the Sleeve ID should face up as shown.

13. Install two O-Rings (BJ 017) into grooves in Shaft.

14. Screw the Adjusting Sleeve (BJ 022) onto the Shaft until the end of the Adjusting Sleeve is aligned with the innermost edge of the wrench flat on the Shaft.

15. Install the Backup Ring (BJ 071) and finally the O-Ring (BJ 072) into the groove at the end of the Shaft (22k only).

16. Slide entire Shaft assembly into Body.



17. Adjust the piston depth so that there is about a 1/16" (.06) gap between the outer face of the piston and the inner face of the retaining ring (see detail).

18. Place the two Wave Springs (BJ 014-D) on top of bearing. Fill the swivel with viscous fluid until the Wave Springs are covered. Rotate shaft occasionally to aid in removing air bubbles. It may take several hours to fully bleed out all of the air from the fluid.

19. Apply grease to the H.P. Seal (HC 012-TO) and install in bore of shaft. Install Seat (MJ 011-C) on top of Seal, as shown in the Maintenance Section.

20. Apply anti-seize to threads of Inlet Nut and thread into Body. Tighten to 60 ft-lb.

21. Install Port Screw (BJ 026).

