BISON PUMPS
The Power of Water in Your Hands

Model 700 Maintenance Manual

Rev A

Bison Pump Model 700

Maintenance Instructions

⚠ Caution: Failure to carefully follow procedures may result in property damage and serious injury.

⚠ Caution: The following personal protective equipment is recommended during all maintenance operations:

- Safety Glasses

Recommended Tool List:

1. One (1) 7/16” Box Wrenches
2. Two (2) 9/16” Box Wrenches
3. One (1) 5/32” Allen Wrench
4. One (1) Flathead Screwdriver with small tip (1/4”)
5. One (1) 3/16” Allen Wrench
6. One (1) 12 oz. Hammer
7. One (1) 5/32” Drift Punch
8. One (1) Pair of Safety Goggles or Glasses
9. One (1) Internal Snap Ring Pliers, .070”-.078” Tip – **Available for Purchase**
10. One (1) Can Pam Cooking Spray® or Olive Oil
11. One (1) O-Ring Pick Tool – **Included in Kit**
12. One (1) Adjustable Pipe Wrench (18”)
13. One (1) Roll Teflon Tape – **Available for Purchase**
14. One (1) Long Screwdriver or Dowel (16”)

Contents of Maintenance Kit:

55-100-2-04-01

Part Description	Quantity	Bison Part Number
Top Plate:		
1. Securing Top Plate		
a. Custom Low-Profile Internal Hex Fastener	1	50-001-0-08-02
2. Internal Top Plate Components		
a. Packing Gland Nut	1	50-100-0-07-00
b. Backing Washer, Nylon 5/8” OD	1	04-000-5-40-02
c. Packing Gland Cup Seal 0.5” ID	1	04-001-3-71-01
d. Bottom Bushing	1	50-100-0-08-05
3. External Top Plate Component		
a. O-Ring Buna	1	04-103-3-70-02
Piston Assembly/Pump Body:		
4. Check Valve	1	04-000-5-75-01
5. Internal Snap Ring, Stainless Steel	1	04-022-1-68-01
6. Piston Cup Seal	1	04-002-3-71-03
Handle:		
7. Link Washer, Nylon 3/8” OD	4	04-000-5-40-01
8. Ny-Loc Nut, Link Connection	2	04-000-1-50-20
9. Ny-Loc Nut, Shoulder Bolt	1	04-000-1-50-29
10. Spacer, Nylon	2	04-000-5-40-03
Tools:		
11. O-Ring Pick Tool	1	55-001-0-07-00


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2A
2B
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1) **Handle Disassembly:**

a. Use two 9/16” wrenches to turn the Ny-loc nuts counter-clockwise to loosen and remove them from the bolts as shown below. Discard the used Ny-loc nuts as they will be replaced.

b. Remove the two bolts from the assembly and set aside for reassembly, along with the Links. Discard the used Link Washers as they will be replaced.

c. Use a 3/16” Allen wrench and a 7/16” wrench to loosen and remove the Ny-loc nut from the shoulder bolt.

d. Remove the bolt from the assembly. Separate the Handle from the Lift Rod and set aside for later reassembly.

i. Nylon Spacers will fall out of the handle. Discard these and use the new ones provided in the Maintenance Kit.

Figure 1

2) **Top Plate/Rod Assembly removal from Cylinder Body and separation:**

a. Use a 5/32” Allen wrench or flat head screwdriver (1/4” tip) to loosen and remove the 4 fasteners attaching the top plate to the cylinder body, in a counter-clockwise direction, as shown in ***Figure 2***. Set aside fasteners for reinstallation. There is 1 spare screw in the Maintenance Kit.

b. Carefully lift the top plate and Piston Assembly to separate it from the Pump Body. This should require minimum force to remove.

c. Separate the Rod Connector from the Lift Rod by unthreading it completely.

i. Set Rod Connector – Heim Joint aside for reuse.

d. Separate the Lift Rod from the Top Plate.

Figure 2

3) **Top Plate Disassembly:**

a. Use your hand, loosen and remove the Gland Nut by turning it counter-clockwise, as shown in ***Figure 3***. Discard the used Gland Nut. There is a replacement component, located in the Maintenance Kit.

Note: If you cannot loosen the Gland Nut by hand, use a 1-1/8” open end wrench or a pair of pliers to lightly apply pressure in the counter-clockwise direction until the Gland Nut beaks loose. Then run the Gland Nut out by hand and remove.

Figure 3

Figure 4

b. Use the O-ring Pick provided in the Maintenance Kit to remove the Packing Gland Cup Seal, Backing Washer and Bottom Bushing, as shown in ***Figure 4.*** Discard all removed components. There is a replacement for each, located in the Maintenance Kit.

4) **Rod/Piston Cup Disassembly:**
   a. Use the O-ring Pick Tool to remove the Piston Cup Seal from the outer surface of the piston. Discard the seal, it will be replaced using new components from the Maintenance Kit.
   b. Thoroughly clean the Piston and Lift Rod with fresh water, paying close attention to the Cup Seal groove.

5) **Lower Check Valve Disassembly:**
   a. The Lower Check Valve typically is not a maintenance issue. In the event the pump is losing its prime, there is likely a malfunction with the Lower Check Valve.

Note: Due to the arduous maintenance process involved with replacing the Lower Check Valve, it is ill-advised to change this component if it is in good working order. In the event there is a malfunction, continue using the steps below.

   b. Use a 9/16" box wrench or socket to loosen and remove the 4 Ny-Loc Nuts from the mounting bolts in the base. This will allow access to the water source connection. Set all components aside, as they will be reinstalled.
   c. Use an 18" adjustable pipe wrench to disconnect the water source from the pump. Turn the wrench to loosen the nut, taking care not to over-torque or damage the pump or water source line components. If you are looking down on the wrench from above the pump, it will turn in a clockwise direction to loosen the fitting.
   d. With the unit disconnected from the water source line, turn the pump over to gain access to the Check Valve. Use Internal Snap Ring Pliers, with .070" tips, to remove the Snap Ring from the base. Squeeze the pliers together to compress the ring, then pull the ring from the cavity.
   e. Use a 16" long screwdriver (or a ¼" – ½" diameter metal rod) to unseat and remove the Lower Check Valve. Insert the tool into the top of the Pump Body and place the tip on the top of the check valve as shown in ***Figure 5***.
   f. Use the palm of your hand or a small 12oz. hammer to lightly tap the Check Valve until it is removed from the cavity. Take care not to damage the wall of the cavity or the ring groove. Discard the used Check Valve as it will be replaced by a new valve from the Maintenance Kit.

Figure 5

6) **Bottom Plate Reassembly:**

a. Visually inspect the cavity, the pump cylinder, and the new components to be assembled. Ensure all parts are free of damage, contamination, and mechanical malfunction. Depress the check valve to ensure proper functionality and smooth motion. Clean Parts if necessary.

b. Coat the outer body of the Check Valve with Pam Cooking Spray © or Olive Oil. It is very important that the Check Valve is inserted into the bottom of the cavity with the correct orientation. The "Bullet" end should be inserted first into the cavity.

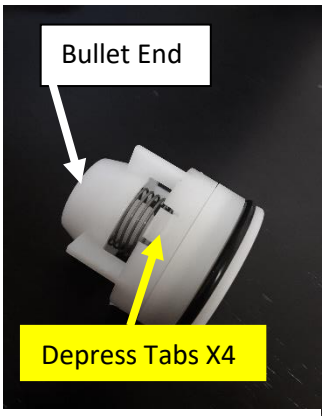

Figure 6


Figure 7

c. Use a flat head screwdriver to depress all 4 plastic tabs on the Check Valve center rim as shown in ***Figure 6***. Press the Check Valve into the cavity of the Piston, "Bullet" end first (***Figure 6***), until the Check Valve is seated and clears the Snap Ring Groove. If any part of the Groove is covered by the Check Valve, it is not properly seated and requires more force to properly seat it, ***see Figure 7***.

d. Use Snap Ring Pliers, .070" tip, to insert the Snap Ring into the Groove.

e. Ensure proper functionality and full range of motion in the Check Valve and proper seating of the Snap Ring.

7) **Pump Body Installation:**

a. Visually inspect the threaded connection areas of the Pump Body and the Water Source Line for damage and cleanliness. Clean parts if necessary.

b. Wrap fresh Teflon tape around the threads of the Water Source Line. Set the Pump Body over the Water Source Line, aligning the mating connection. Thread the Pump Body onto the Water Source by turning it Clockwise. Tighten the connection with a Pipe Wrench in the Clockwise Direction.

c. Align the Pump Body so that the 4 attachment bolts in the Base Plate align with their original mount holes.

d. Install the 4 Carriage Bolts through the base plate and mounting surface. Use a 9/16" wrench or socket to install 4 Flat Washers and 4 Nuts onto the Carriage Bolts. Thread the nuts in a clockwise direction until they are tight.

8) **Rod/Piston Assembly:**

a. Visually inspect the Piston, Rod and components for damage and cleanliness. Clean parts if necessary.

b. Install new Piston Cup Seal onto the Piston Cup using your hands to work the Seal over the cups radial surface. Make sure the "Cup" Side of Cup Seal (as shown in ***Figure 8***) is facing towards the Piston Lift Rod ***and/or*** the top of the Pump Body.

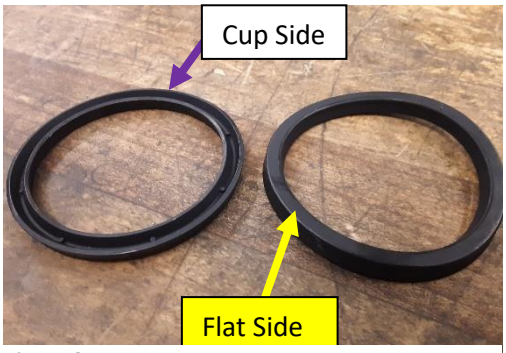

Figure 8

9) <u>Top Plate/Lift Rod Assembly:</u>

a. Visually inspect the Lift Rod Assembly, Top Plate and all new components for damage and cleanliness prior to assembly. Clean parts if necessary.

b. Insert the Piston/Lift Rod Assembly into the Top Plate with the Rod protruding through the top surface of the Top Plate. As shown in ***Figure 9***.

c. Install the Bottom Bushing onto the rod and into the threaded cavity of the Top Plate. The smaller Radial Diameter should be down or first when inserting into the cavity. The Bushing should seat into the cavity and the lower surface should be flush with the lower surface of the Top Plate. See ***Figure 9.***

d. Install the Seal onto the rod, with the Cup Side down towards the Top Plate. Run the seal down to mate with the cavity in the Top Plate as shown in ***Figure 10 and 10-1.***

e. Use your fingers or the Pick Tool to work the Seal into the cavity until the upper surface of the Seal is flush with the upper surface of the Top Plate as shown in ***Figure 11***. (Lubricating the seal may help this process.)

Figure 9

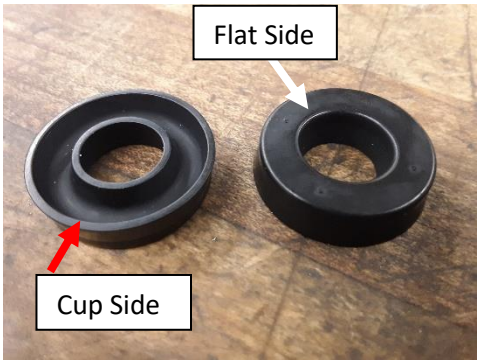

Figure 10.1

Figure 10

Figure 11

f. Install the Nylon Backing Washer onto the Lift Rod, in any orientation.

g. Install the Packing Gland Nut onto the Lift Rod with the threaded side down. Push the Gland Nut into the Top Plate cavity and turn clockwise using your fingers until the threads engage. Once the threads engage, turn the Packing Gland Nut two full revolutions in a clockwise direction. (After installation, this Gland Nut might need to be tightened slightly if it is leaking. Over time the seal could lose elasticity and may require this nut to be tightened. This will only be necessary if this seal is leaking water during normal use of the Bison Pump.)

10) **Handle Reassembly:**
    a. Visually inspect all components for damage and cleanliness prior to assembly. Clean parts if necessary.
    b. With the Lift Rod extended through the Top Plate, thread the Rod Connector – Heim Joint threaded bolt into the top of the Lift Rod until the spacer bolt seats against the Lift Rod.
    c. Slide the Handle over the Rod Connector so that the mating holes are aligned (Note – It is often easier to perform this task with the Handle upside down). Insert the Shoulder Bolt into the Handle, protruding part of the way through. Slide one nylon Spacer onto the bolt. Next slide the Rod Connector onto the bolt and then add the last Spacer before pushing the Shoulder Bolt to the opposite side of the Handle. Finger tighten the Ny-Loc Nut onto the Shoulder Bolt.
    d. Use a 3/16" Allen Wrench and 7/16" Box Wrench or Socket to tighten the Ny-Loc Nut onto the Shoulder Bolt in a clockwise direction until snug. Make sure to not over torque this nut as it creates a friction point making pumping more strenuous.
    e. Use two 9/16" Box Wrenches or Sockets to install the 2 Handle Links, 4 Link Washers, 2 Bolts and 2 Ny-loc Nuts onto the Handle and Top Plate flange.
    f. Tighten the nuts in a clockwise direction using both wrenches and sockets. Make sure to not over torque this nut as it creates a friction point making pumping more strenuous. It should not take a high amount of force to operate the pump. If the handle is hard to move, loosen the nuts slightly until the pump operates smoothly and with ease.

11) **Mechanical Assembly Installation into Pump Body**
    a. At this point the entire Pump System should be in two assemblies and 4 screws used to attach the Mechanical Assembly to the Pump Body.
    b. Inspect the Piston and Pump Body for damage and cleanliness prior to installation.
    c. Lubricate the inside of the Pump Body and the Piston Cup Seals with Pam Cooking Spray® or Olive Oil.
    d. Insert the Mechanical Assembly into the Pump Body and align the mounting holes in the Top Plate with the holes in the Top Ring.
    e. Use a 5/32" Allen Wrench to thread the screws in a clockwise direction until they are tight.

12) **Test the Pump:**
    a. Grasp the handle and pull up and down. Listen for the "Burp" sound of the Check Valve. As the handle is pulled upward the bottom Check Valve should make a "Burping" sound. When the handle is pushed downward, the Piston Check Valve should make a "Burping" sound.
    b. As mentioned in earlier, if the Packing Gland Nut is leaking, tighten ¼ turn until it stops.

For Technical Help call our Toll-Free Number at 1(800)339-2601.