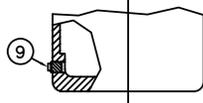
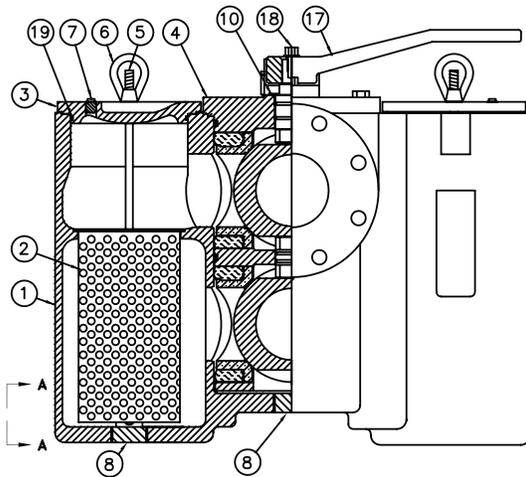
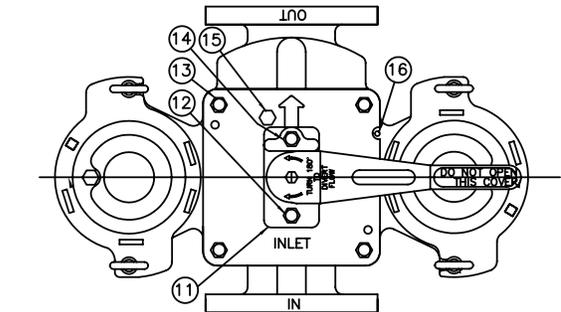
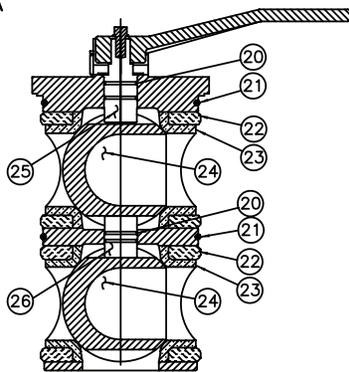


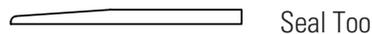
Read all the following information and instructions prior to installing & operating the Strainer. Failure to comply with these instructions could result in bodily injury or property damage.



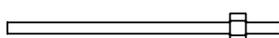
VIEW A-A



VIEW B-B



Seal Tool



Extractor Tool I

### Parts List for Eaton Model 53 BTX

Item	Description
1.	Duplex Strainer Body
2.	Strainer Basket (2) *
3.	Basket Cover (2)
4.	Cartridge
5.	Stud (4)
6.	Eye Nut (4)
7.	Pipe Plug (2)
8.	Pipe Plug (3)
9.	Pipe Plug (2)
10.	O-Ring, Cover (2) *
11.	Stem Retainer
12.	Cap Screw
13.	Cap Screw (4)
14.	Cap Screw
15.	Vent Valve
16.	Pin
17.	Handle
18.	Cap Screw
19.	Washer
20.	O-Ring, Stem (4) *
21.	O-Ring, Cartridge (2) *
22.	Seal (4) *
23.	Seat (4) *
24.	Ball (2)
25.	Stem, Top
26.	Stem, Middle

\* Recommended Spare Parts List

Item	Description
2	Strainer Basket (2)
10	O-Ring, Cover (2)
20**	O-Ring, Cover (4)
21**	O-Ring, Cartridge (2)
22**	Seal (4)
23**	Seat (4)

\*\* Only supplied in a "#53 Sealing Kit"

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## CARTRIDGE MAINTENANCE

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### IMPORTANT

For 2", 2½", 3" & 4" Strainers, it is advisable to support the cartridge assembly by external means (hoist, slings, etc.) during cartridge maintenance.

For ¾", 1", 1-¼" & 1-½" Strainers, use your own discretion to support the cartridge assembly during cartridge maintenance.

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For Tools and Items, refer to Diagram & Parts List, pg. 1

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## CARTRIDGE REMOVAL AND INSPECTION

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### CAUTION

To remove cartridge assembly, first isolate the strainer (shut down your pumps, close valves, etc.). Slowly open vents, releasing strainer internal pressure and open **plugs, Item 9** at bottom of basket wells (or the drain valves if installed) to drain the fluid from the strainer.

---

1. Rotate the **handle, Item 17**, 90 degrees to "Inlet" on **cartridge, Item 4**.
  2. Remove the four (4) **cap screws, Item 13** that secure the cartridge assembly to the strainer body.
  3. Remove plastic caps from threaded holes "A" on top of cartridge. Thread the **Extractor Tool** (provided), into a threaded hole in the top of the cartridge. Use a socket or box wrench for turning. As the **Extractor Tool** turns, the cartridge rises from the strainer body.
  4. As the **upper seals Item 22 and upper seats Item 23** clear the top of body, remove the upper seals and seats.
- 

**Top ball, Item 24** cannot be removed with the handle positioned over the inlet.  
Do not remove the **Top Ball** at this time.

---

5. Continue turning **Extractor Tool** until the **lower seals, Item 22 and lower seats, Item 23** become visible as the cartridge assembly continues to rise.

---

Lower seals, seats and ball remain in place with the handle positioned over the inlet. Do not remove any of these components at this time.

---

6. Continue to raise the cartridge assembly until it has cleared the cartridge bore of the body.
  7. Place the cartridge assembly on a clean surface. With cartridge upright & inlet towards assembler, remove **lower seats & lower seals** at this time.
  8. Slowly rotate the **handle, Item 17**, 90 degrees counter clockwise until the handle makes contact with **stem retainer, Item 11**. **Pay special attention to both balls as they may shift and dislodge from the cartridge at this time.**
  9. Remove the **lower and upper balls, Item 24**.
  10. Remove the **handle screw, Item 18** (and washer if provided) and then remove **handle, Item 17**. Remove the two (2) **screws, Items 12 & 14** that hold down the **stem retainer, Item 11**. Remove the **stem retainer, Item 11 and stem retainer washer, Item 19**.
  11. Reattach **handle, Item 17** to **top stem, Item 25** with **handle screw, Item 18** and washer if provided. Pull **top stem, Item 25** out from top of cartridge. Next remove **middle stem, Item 26** by pushing downward through cartridge central hole.
  12. Inspect the two (2) **cartridge O-rings, Item 21**, the four (4) **top and middle stem O-rings, Item 20** and replace. Inspect **top and bottom balls, Item 24** for scoring. Replace as necessary.
- 

### IMPORTANT

Keep used seats separate from new seats to prevent reinstalling used seats by mistake

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## CARTRIDGE REASSEMBLY

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Note: Make sure that all parts are free from dirt.

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### IMPORTANT

All O-rings and mating surfaces require lubrication. Use a light film of Process Compatible lubricant.

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13. Lubricate **middle stem O-rings, Item 20** and inside of the cartridge middle stem bore.
14. Insert **middle stem, Item 26** from bottom of cartridge into the cartridge middle stem bore (chamfer provided).

Ensure that the **middle stem, Item 26** is equally spaced between upper and lower ball bores of the cartridge.

Ensure that both **middle stem O-rings, Item 20** are compressed into the cartridge middle stem bore.

Align flat tabs of the **middle stem, Item 26** to be inline to the large ports of the cartridge. This allows the flats of the **middle stem, Item 26** to be aligned with the slots of the **balls, Item 24**.

15. Lubricate the **top stem O-rings, Item 20** and inside of the cartridge top stem bore. Insert **top stem, Item 25** into top of cartridge. Push down until shoulder on tab end of **top stem, Item 25** is flush with inside of the large ports of the cartridge (cartridge ball bore).
16. Align flat tab on **top stem, Item 25** to be in-line to the large ports of the cartridge. **Top stem** tabs and **middle stem** tabs are to be in the same direction. Remove handle from **top stem**.
17. Place **stem retainer washer, Item 19**, then **stem retainer, Item 11** over **top stem, Item 25**. Centralize the hole of the **stem retainer, Item 11** around the **top stem, Item 25**. The two (2) small locating posts under **stem retainer** point towards the inlet on the cartridge. Insert and tighten the two (2) **screws, Items 12 & 14**.
18. Attach **handle, Item 17** to **top stem, Item 25** using **screw, Item 18** (and washer if provided). Move handle counter-clockwise until contact is made with the stem retainer.
19. Lay cartridge down on table with top of cartridge away from assembler and inlet facing up and the **handle, Item 17** pointing to your right.
20. Insert **upper ball, Item 24** keeping closed side of ball opposite the **handle, Item 17** (see View "B-B"). Assemble two (2) sets of **seals Item 22** and **seats, Item 23**. Match the recess groove in the **seat** to raised channel in the **seal**. Slide the **seat and seal** assemblies into the cartridge around the **upper ball, Item 24** keeping the recess groove in the **seat** and the raised channel in the **seal** to top of cartridge. **Wrap securely about the center with wire tie provided.**
21. Insert **lower ball, Item 24** keeping closed side of ball opposite the **handle, Item 17** (see View B-B). Assemble two (2) sets of **seals Item 22** and **seats Item 23**. Match the recess groove in the **seat** to raised rib on the **seal**. Slide the **seat and seal** assemblies into the cartridge around the **lower ball, Item 24** keeping the recess groove in the **seat** and the raised channel in the **seal** to top of cartridge. **Wrap securely about the center with wire tie provided.**

22. Stand the cartridge up with top up and inlet facing assembler. Check for alignment.

---

**IMPORTANT**

Inside diameters of balls are to be aligned with inside diameter of seats.

---

23. Lubricate the outer face of each of the **seals**, cartridge **O-rings** and inside of cartridge bore in the body with a light film of Process Compatible lubricant.

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**INSERTING CARTRIDGE**

When inserting the cartridge into the strainer body:

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**Sizes 3/4" through 1"**: Make sure that the flow arrow on the cartridge is pointing 45 degrees to either side of the outlet on the body.

**Sizes 1-1/4" through 4"**: Make sure that the word "INLET" on the top of the cartridge is directly above the inlet of the body.

---

24. Lift cartridge and place inside the cartridge bore of the body. **Carefully start (or lead) the lower seals, Item 22 into the cartridge bore of the body.** Remove wire tie around the lower seals when **lower seals, Item 22** have been lowered halfway into cartridge bore of the body.

---

**Sizes 1-1/4" through 4"**: Make sure that the lower **seals, Item 22** smoothly pass through all of the internal openings (or ports). If the lower **seals** start to extrude into ports, gently tap bottom of the **seals** with the **Seal Tool** (provided). Thus greatly assisting the leading edges of the **lower seals** into cartridge bore of the body

---

25. Push cartridge down until half of the **top seals, Item 22** are in the cartridge bore of the body. Use the **Seal Tool** (provided) as required. Follow same instructions for the **upper seals** as described in #24 above for the **lower seals**.
26. **Remove wire tie around the top seals at this time.**
27. **Sizes 3/4" through 1"**: Push cartridge down until just above roll pin in body. Turn cartridge 45 degrees, so that the flow arrow (cast on the top of the cartridge) is aligned with the outlet of the strainer. Insert the four (4) **cap screws, Item 13** and turn until cartridge is all the way into body.

# Cartridge Maintenance

## Model 53 BTX Duplex Strainer, Sizes $\frac{3}{4}$ " - 4"

### IMPORTANT

Verify that the top & lower seals have not extruded into the ports. If seals have extruded, gently tap bottom of the seals with the Seal Tool until seals are past the ports. If not, repeat "Inserting Cartridge" instructions.

28. Sizes  $1\frac{1}{4}$ " through 4" cartridge does not lower sufficiently to tighten the four (4) cap screws, Item 13, you will need to run a washer and nut up the Extractor Tool. Insert the Extractor Tool through the bolt hole in cartridge and into screw thread in strainer body. With washer between nut and cartridge, tighten the nut that lowers the cartridge into the body a sufficient distance for the four (4) cap screws, Item 13 to be tightened.

### IMPORTANT

Verify that the top & lower seals have not extruded into the ports. If seals have extruded, gently tap bottom of the seals with the Seal Tool until seals are past the ports. If not, repeat "Inserting Cartridge" instructions.

29. Tighten the four (4) cap screws, Item 13, until the cartridge is completely in the strainer body.

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Cartridge Assembly

