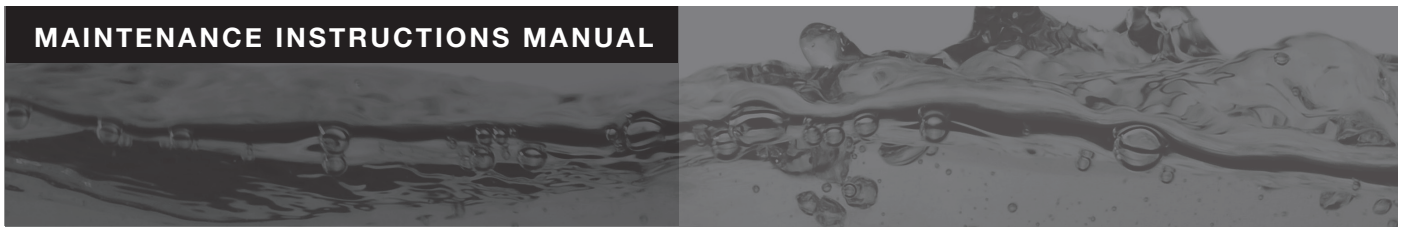
MAINTENANCE INSTRUCTIONS MANUAL



U.S. PIPE VALVE & HYDRANT

Sentinel® 250 Fire Hydrant

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⚠ WARNING:

1. Read and follow instructions carefully. Proper training and periodic review regarding the use of this equipment is essential to prevent possible serious injury and/or property damage. The instructions contained herein were developed for using this equipment on fittings of Mueller manufacturer only, and may not be applicable for any other use.
2. DO NOT exceed the pressure ratings of any components or equipment. Exceeding the rated pressure may result in serious injury and/or property damage.
3. Safety goggles and other appropriate protective gear should be used. Failure to do so could result in serious injury.

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Sentinel® 250 Fire Hydrant

Inspection and Lubrication

⚠ WARNING: Before removing any bolt(s) holding the hydrant together, close the auxiliary hydrant control valve in order to isolate the hydrant from the main water source. Loosen (but DO NOT remove) one Nozzle Cap two turns and check for water under pressure inside the hydrant– bleed off any excess pressure slowly, then remove Nozzle Cap completely. Open hydrant Main Valve completely. A continuous flow of water, no matter how slight, indicates that the hydrant is not properly isolated from the main water supply. That problem must be corrected before any hydrant disassembly can safely proceed. Disassembly of the hydrant with pressurized water forcing against the Main Valve could result in unexpected ejection of hydrant parts, debris or a high-pressure water stream, which could result in serious bodily injury.

ROUTINE INSPECTION & LUBRICATION

Sentinel 250
Fire Hydrant Pressure Rating:
250 psig (1723 kPa)

To ensure their readiness for instantaneous use, it is recommended that Fire Hydrants be inspected and tested at six-month intervals. Inspect visually for damaged or missing parts. Loosen one Nozzle Cap slightly and tighten the others. Open Hydrant fully. Tighten loose Nozzle Cap when water starts to flow. Check all connection points for leaks. Turn Operating Nut to fully CLOSED position. Remove one Nozzle Cap, stand on the side of Hydrant opposite the cap removed, open Hydrant fully, and flush Barrel and Hydrant Lateral. Turn Operating Nut to fully CLOSED position. Remove all Nozzle Caps. Clean and lubricate threads. Examine inside of Barrel to make certain Drain Valves have completely drained water from Barrel. If water fails to drain from Barrel, it may be caused by one or more of the following conditions:

1. Water Table in ground is higher than drains.

2. When Hydrant was installed, coarse gravel was not placed around Drains, in locations where ground has a make up such that it will not absorb water.

3. Drains are stopped by some foreign material.

4. Failure to leave Cap off of Hydrant to allow air to enter, so Barrel will drain. The foregoing procedure introduces full line pressure to Drain Valves. It provides the best method for cleaning Drain Valves using water pressure.

IMPORTANT: Initial installation of Hydrant MUST BE MADE PROPERLY, so Standpipe Coupling will function properly. Hydrant should be blocked at ground line and around Shoe, using concrete or similar substance to prevent ground from giving way when Hydrant is struck. For additional information on Hydrant anchorage, blocking, and drainage, see AWWA Standard C600 and Manual M17.

All hydrants should be inspected and maintained as recommended per AWWA M17– latest revision. Hydrant should be lubricated or regreased at least annually.

Hydrants dated 2010 and after include a Brass Plug in the top of the Operating Nut, and the following lubrication guidelines apply. Hydrants equipped with a plug may be lubricated during routine flushing of hydrant.

1. With Hydrant in closed position, remove Brass Plug from operating nut.

2. Install grease fitting.

3. Apply 8 pumps of Diana 2100 food grade grease (or equivalent lubricant compatible with calcium sulfonate grease), using a common hand held grease gun.

4. Remove grease fitting and reinstall Brass Plug.

5. Open hydrant fully to verify operation.

6. Close Main Valve tightly, then ¼ turn in the opening direction to relieve tension on operating mechanism.

Rotating Hydrant to Face in Desired Direction / Installing Extension Section

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

ROTATING HYDRANT

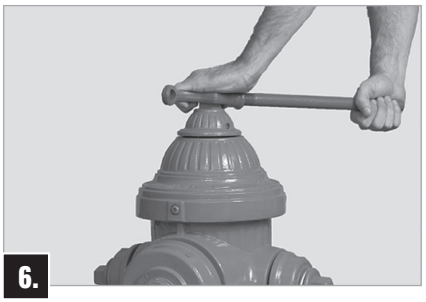
1. Shut off Auxiliary Valve for hydrant. Loosen, but DO NOT disassemble Standpipe Coupling.

2. Open hydrant Main Valve three turns.

3. Rotate hydrant to desired position.

4. Carefully tighten the Coupling Bolts & Nuts to 50 ft-lbs torque. Be sure they are drawn up evenly on each side leaving equal space between coupling halves on each side of hydrant.

5. Open Auxiliary Valve for hydrant and check for leaks from Standpipe Coupling.



6. Close hydrant Main Valve tightly, then ¼ turn in the opening direction to relieve tension on operating mechanism.

INSTALLING EXTENSION SECTION

1. The depth of bury of the Sentinel 250 hydrant can be extended in 6" increments with the use of Standard Extension Kits in units from 6" to five feet in length. Close Auxiliary Valve for hydrant.

2. Remove one Hose Nozzle Cap and open hydrant to relieve pressure on hydrant.

3. Drive out Operating Nut Pin from side of Operating Nut– ONLY strike the pin from the end that is most deeply recessed inside the Operating Nut. Use of a heavy punch at least half the diameter of the pin is recommended.

4. Remove the Operating Nut from the Bonnet, making sure not to lose the Operating Nut Seal that is inside the Operating Nut.

Installing Extension Section

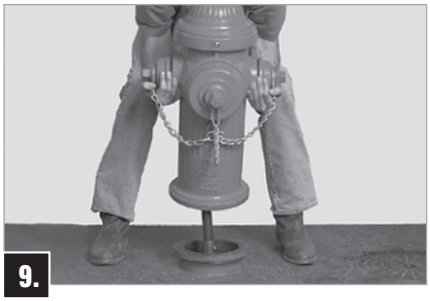
EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

5. Using small Allen Wrench, loosen Hold Down Nut Set Screw.

6. Remove Hold Down Nut, using Combination Spanner Wrench by turning **counter-clockwise.**

7. Use socket of Combination Wrench to remove Travel Stop Nut.

8. Remove Revolving Nut by turning in hydrant opening direction. It is not necessary to remove the Anti-Friction Bearing from the Revolving nut.



9. Remove Standpipe Traffic Coupling and lift Upper Standpipe and Bonnet assembly straight up and off of Valve Rod. DO NOT lose Standpipe Coupling Seal.

10. Remove the Upper Valve Rod and Traffic Rod Coupling as a unit by removing the lower Cotter Pin and lower Clevis.

11. Assemble the Extension Rod Coupling onto one end of the Extension Rod using one of the Clevis Pins and Cotter Pins from the kit.

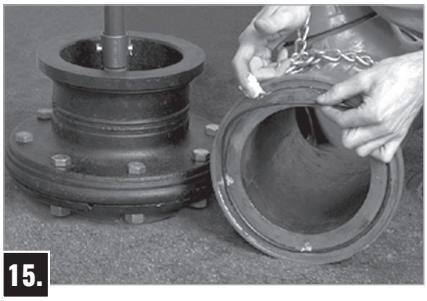
12. Install Rod Extension assembly onto the Lower Valve Rod and secure it with a Clevis Pin and Cotter Pin from the kit.

13. Place Flange Gasket onto top of Lower Standpipe and install Extension Standpipe using two Flange halves and eight Bolts and Nuts. Tighten (wrench tight) all bolts evenly.

Installing Extension Section

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

14. Install Upper Valve Rod with Coupling still attached to top of Extension Rod using the original Clevis Pin and Cotter Pin. Make sure Rod Coupling is installed with words “This End Up” properly orientated.



15. Place new Standpipe Coupling Seal into groove in bottom of Upper Standpipe. Use grease or gasket cement in groove to hold it in place.

16. Carefully lower the Upper Standpipe and Bonnet assembly down over the Upper Valve Rod, taking care not to disturb the two O-Rings inside the bore of the Bonnet.

17. Align the Nozzles.

18. Assemble the Standpipe Traffic Coupling, observing the “Top Side” markings on the coupling halves. Carefully tighten the Coupling Bolts & Nuts to 50 ft-lbs torque. Be sure they are drawn up evenly on each side leaving equal space between coupling halves on each side of hydrant.

19. Regrease Upper and Lower Chambers of Revolving Nut and reinstall it by turning it in the hydrant closing direction. Apply grease over entire Thrust Collar and Anti-Friction Bearing area, and the areas above and below them. Make sure the Anti-Friction Bearing is in place on top of the Revolving Nut.

20. Use socket of Combination Wrench to reinstall Travel Stop Nut and tighten securely.

21. Reinstall and tighten the Hold Down Nut.

22. Install Hold Down Nut Set Screw and tighten.

Installing Extension Section

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

23. Reinstall the Operating Nut and secure it with the Locking Pin.

24. Make sure the hydrant is fully closed, then open Auxiliary Valve for hydrant.

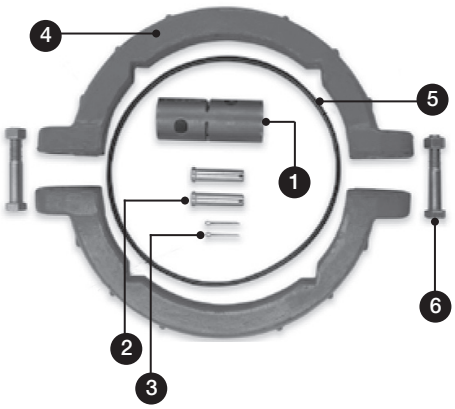
25. Loosen one Hose Cap slightly to bleed air and open the hydrant fully – then when water begins flowing retighten the Hose Cap.

26. Check all connections for leakage, then close hydrant tightly. Remove one Hose Cap to allow the hydrant to drain completely. Replace Hose Cap tightly.

27. Turn Operating Nut to make sure Main Valve is closed tightly, then turn in opening direction ¼ turn to remove stress from operating mechanism.

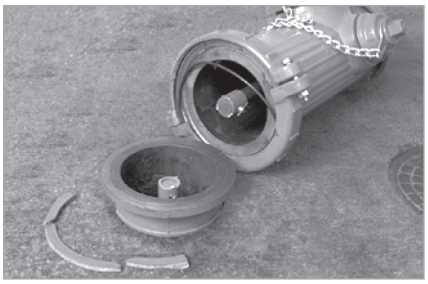
EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

TRAFFIC REPAIR KIT



Traffic Repair Kit Includes:

ID	DESCRIPTION
1	Traffic Valve Rod Coupling
2	Clevis Pins – 2
3	Cotter Pins – 2
4	Standpipe Traffic Coupling Halves – 2
5	Standpipe Coupling Seal
6	Standpipe Coupling Bolts and Nuts – 2



NOTE: The hydrant can be restored to service without removing the Bonnet.

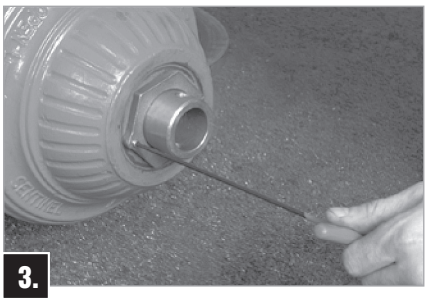
RESTORING SERVICE AFTER TRAFFIC KNOCKOVER

1.

Shut off auxiliary valve for hydrant. Drive out Operating Nut Pin from side of Operating Nut– ONLY strike the pin from the end that is most deeply recessed inside the Operating Nut. Use of a heavy punch at least half the diameter of the pin is recommended.

2.

Remove the Operating Nut from the Bonnet, making sure not to lose the Operating Nut Seal, which is inside the Operating Nut.



3.

Use a small Allen Wrench to loosen the Hold Down Nut Set Screw. With the Combination Spanner Wrench, turn the Hold Down Nut **counter-clockwise** and remove it.

4.

Use socket of Combination Wrench to remove Travel Stop Nut.

5.

Hold Valve Rod with one hand and turn the Revolving Nut in the direction of hydrant opening to remove it. It is not necessary to separate the Anti-Friction Bearing from the Revolving Nut.

6.

Withdraw the Upper Valve Rod from inside the Upper Standpipe.

Restoring Service After Traffic Knockover

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

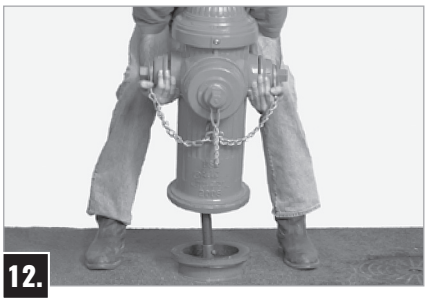
7. Remove torn Traffic Valve Rod Coupling, Cotter Pins and Clevis Pins from Upper and Lower Valve Rod, and discard them.

8. Assemble the replacement Traffic Valve Rod Coupling onto the end of the Upper Valve Rod using one Clevis Pin and Cotter Pin from the kit. The Traffic Valve Rod Coupling must be installed with the words “This End Up” properly orientated.

9. Assemble the Upper Valve Rod and Traffic Valve Rod Coupling onto the Lower Valve Rod and retain it with the remaining Clevis Pin and Cotter Pin from the kit.

10. If remnants of the original Standpipe Traffic Coupling remain on the Upper Standpipe, remove and discard the coupling and its bolts.

11. Place new Standpipe Coupling Seal into groove in bottom of Upper Standpipe. Use grease or gasket cement in groove to hold it in place.



12. Carefully lower the Upper Standpipe and Bonnet assembly down over the Upper Valve Rod, taking care not to disturb the two O-rings inside the bore of the Bonnet.

13. Align the nozzles.

14. Assemble the Standpipe Traffic Coupling, observing the “Top Side” markings on the coupling halves. Carefully tighten the Coupling Bolts & Nuts to 50 ft-lbs torque. Be sure they are drawn up evenly on each side leaving equal space between coupling halves on each side of hydrant.

15. Regrease Upper and Lower Chambers of Revolving Nut and reinstall it by turning it in the hydrant closing direction. Apply grease over entire Thrust Collar and Anti-Friction Bearing area, and the areas above and below them. Make sure the Anti-Friction Bearing is in place on top of the Revolving Nut.

16. Use socket of Combination Wrench to reinstall Travel Stop Nut and tighten securely.

Restoring Service After Traffic Knockover

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, Allen wrench.

17. Reinstall and tighten the Hold Down Nut.

18. Install Hold Down Nut Set Screw and tighten.

19. Reinstall the Operating Nut and secure it with the Locking Pin.

20. Make sure the hydrant is fully closed, then open Auxiliary Valve for hydrant.

21. Loosen one Hose Cap slightly to bleed air and open the hydrant fully – then when water begins flowing retighten the Hose Cap.

22. Check all connections for leakage, then close hydrant tightly. Remove one Hose Cap to allow the hydrant to drain completely. Replace Hose Cap tightly.

23. Turn Operating Nut to make sure Main Valve is closed tightly, then turn in opening direction ¼ turn to remove stress from operating mechanism.

Seat/Main Valve Removal Procedure

⚠WARNING: Before removing any bolts(s) holding the hydrant together, close gate valve to isolate hydrant from main water source. Loosen (DO NOT remove) one nozzle cap two turns and check for water under pressure inside hydrant– bleed off any pressure, then remove nozzle cap completely. Open hydrant main valve completely. A continuous flow of water, no matter how slight, indicates hydrant is not properly isolated from the main water supply, and that problem must be corrected before any hydrant disassembly can proceed. Disassembly of hydrant with pressurized water acting against the main valve could result in unexpected ejection of hydrant parts, debris or high-pressure water stream, which could cause serious bodily injury.

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, seat removal wrench, Allen wrench.

1. Close Auxiliary Valve for hydrant before attempting repairs.

2. Remove one Hose Cap and open hydrant two full turns to relieve pressure on hydrant.

3. Drive out Operating Nut Pin from side of Operating Nut– ONLY strike the pin from the end that is most deeply recessed inside the Operating Nut. Use of a heavy punch at least half the diameter of the pin is recommended.

4. Remove the Operating Nut from the Bonnet, making sure not to lose the Operating Nut Seal that is inside the Operating Nut.

5. With small Allen Wrench, loosen Hold Down Nut Set Screw.

6. Remove Hold Down Nut, using Combination Spanner Wrench by turning **counter-clockwise**.

7. Use socket of Combination Wrench to remove Travel Stop Nut.

8. Remove Revolving Nut by turning in operating direction of hydrant opening. It is not necessary to separate Anti-Friction Bearing from Revolving Nut.

9. Using large Allen Wrench, remove Bonnet Locking Screw.

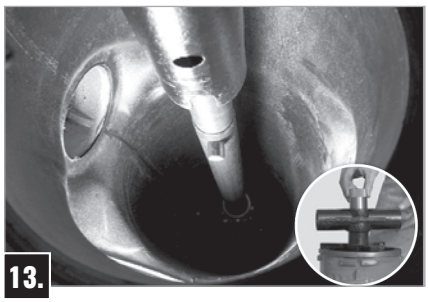
10. With Combination Spanner Wrench, rotate Bonnet 22 1/2 degrees (1/16 turn) **counter-clockwise**. Bonnet lugs will disengage.

Seat/Main Valve Removal Procedure

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, seat removal wrench, Allen wrench.

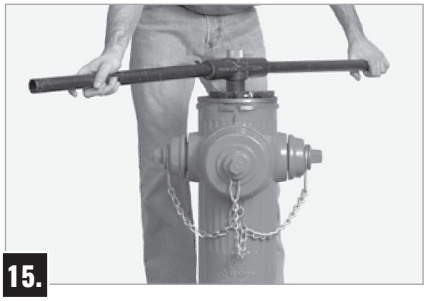
11. Lift Bonnet straight up and off the Upper Standpipe.

12. Remove Bonnet Seal Gasket.



13. Slide slotted end of Seat Wrench over top of Valve Rod and engage the slot with pin in Upper Valve Rod. Tighten Knurled Nut onto end of Valve Rod to hold Seat Wrench in place.

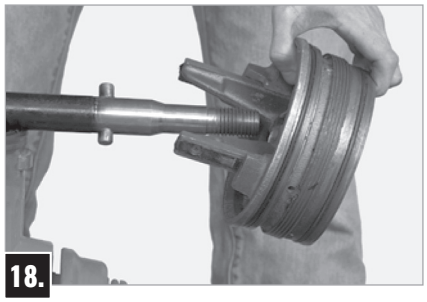
14. Pull up on Seat Wrench, then lower the support arm of the Seat Wrench down onto the top of the Upper Standpipe, and tighten the thumb nut securely.



15. Turn Seat Wrench **counter-clockwise** six to seven turns to loosen the Main Valve.

16. Lift out Seat Wrench, Lower Valve Rod, Main Valve assembly and Seat Ring as a unit.

17. Hold the Lower Valve Rod with a pipe wrench and remove the Lower Valve Plate, turning it **counter-clockwise.**



18. Remove rubber Main Valve and Seat Ring. Clean, inspect and replace any damaged parts. (Main Valve can be reversed to provide new seal). Replace Drain Valve Facings if necessary.

19. Inspect and lubricate Top and Bottom Seat Ring O-rings (replace if necessary).

Seat/Main Valve Removal Procedure

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, seat removal wrench, Allen wrench.

20. Lubricate all threaded surfaces and reassemble. Securely tighten Lower Valve Plate.

21. Lower Main Valve Assembly, turn Seat Wrench **clockwise**, and carefully thread Main Valve and Seat Ring into the base of the hydrant handtight. Raise the Main Valve leaving about 1/2" of play between the Main Valve and Seat. Lower Support Arm and tighten Thumb Screw.

22. Turn Seat Wrench clockwise to tighten Main Valve to 150-200 ft-lbs. Turn on water at the Auxiliary Valve, check for water, and remove Seat Wrench by removing Knurled Nut.

23. Check Bonnet Gasket for proper position and condition, and grease threads on Upper Valve Rod.

24. Lower Bonnet down over Upper Valve Rod, taking care not to disturb two O-rings up inside the bore of the Bonnet. Turn Bonnet **clockwise** and use Combination Wrench to lock it in place.

25. Grease threads on Bonnet Locking Screw and install, making sure Bonnet is centered so Locking Screw sets in the "V" of the locking slot in the Upper Standpipe.

26. Regrease Upper and Lower Chambers of Revolving Nut and reinstall it by turning it in the hydrant closing direction. Apply grease over entire Thrust Collar and Anti-Friction Bearing area, and the areas above and below them. Make sure the Anti-Friction Bearing is in place on top of the Revolving Nut.

27. Use socket of Combination Wrench to reinstall Travel Stop Nut and tighten securely.

28. Reinstall and tighten Hold Down Nut.

Seat/Main Valve Removal Procedure

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, seat removal wrench, Allen wrench.

29. Install Hold Down Nut Set Screw and tighten.

30. Reinstall the Operating Nut and secure it with the Locking Pin.

31. Make sure the hydrant is fully closed, then open Auxiliary valve for hydrant. Loosen one Hose Cap slightly to bleed air and open the hydrant fully – then when water begins flowing retighten the Hose Cap.

32. Check all connections for leakage, then close hydrant tightly. Remove one Hose Cap to allow the hydrant to drain completely. Replace Hose Cap tightly.

33. Turn Operating Nut to make sure Main Valve is closed tightly, then turn in opening direction ¼ turn to remove stress from operating mechanism.

Damaged Nozzle Replacement

EQUIPMENT & TOOLS NEEDED: PPE (Hard hat, safety shoes, safety vest, safety glasses, work gloves).
Tools: Backhoe, lifting straps, spanner wrench, socket wrench, adjustable wrench, nozzle lock, nozzle wrench.

1. Remove the Nozzle Cap of the Nozzle to be replaced.

2. Remove stainless steel Nozzle Lock by driving it out with a pointed tool and hammer.

3. Place Nozzle Wrench on Nozzle with wrench forks facing toward hydrant Upper Standpipe and lock onto Nozzle Drive Lugs. Replace Nozzle Cap and tighten until Cap rests loosely against backside of wrench.

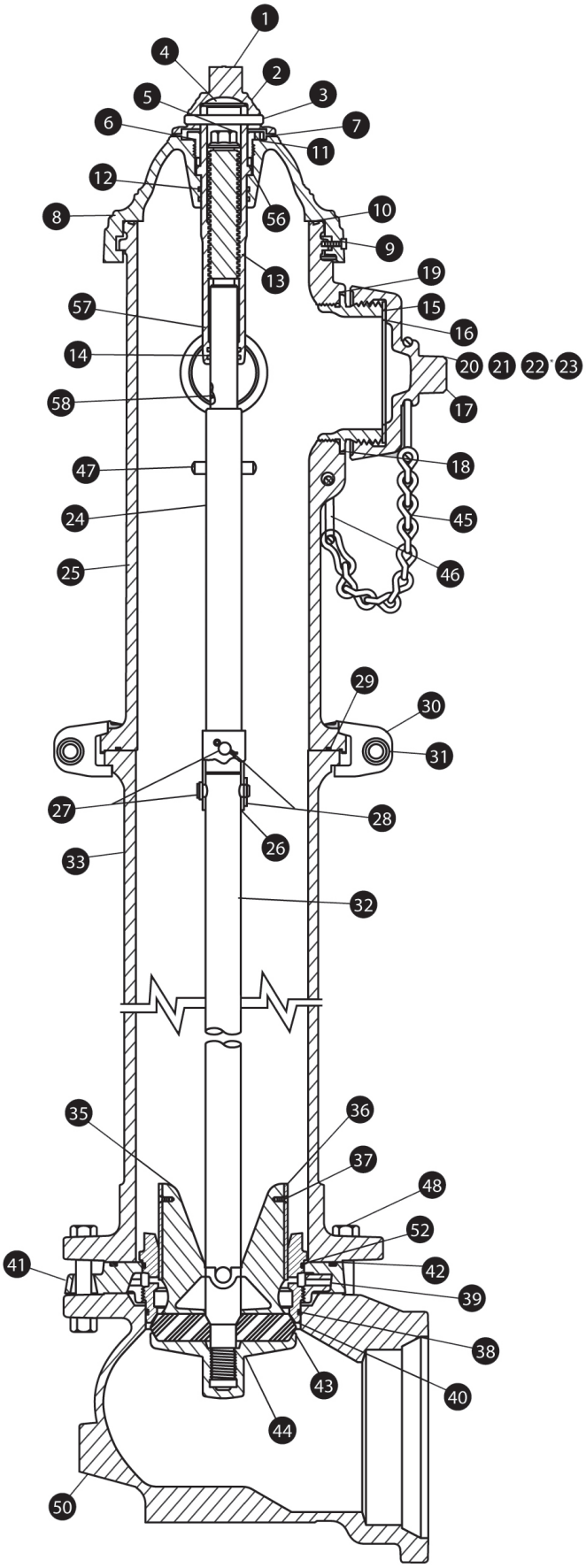
4. Turn the Nozzle clockwise to remove. The wrench may be struck with a heavy brass hammer or additional leverage may be obtained by placing a length of 2” schedule 40 steel pipe over the handle of the wrench.

5. Make sure new Nozzle has its O-ring Seal in place at the base of the fine threads, then lubricate the threads and O-ring. Thread new Nozzle into Upper Standpipe, attach Nozzle Wrench as described in Step 3, and tighten Nozzle to approximately 400-600 ft-lbs torque (100 lbs. pull on a 6’ lever).

6. Remove Nozzle Cap and Nozzle Wrench. Place the Nozzle Lock lengthwise in the slot formed by either of the Nozzle Drive Lugs and the Standpipe bore. Drive the Nozzle Lock in place with a hammer and punch.

NOTE: Wear safety glasses when using a striking tool. The Nozzle Lock does not have to be completely seated into the slot, but it should be well engaged along the entire length of the Nozzle Drive Lug and Standpipe bore.

7. Replace and tighten Nozzle Cap.



PARTS LIST

ID	DESCRIPTION	MATERIAL
1	Operating Nut	Ductile Iron
2	Operating Nut Seal	Rubber
3	Operating Nut Locking Pin	Steel
4	Hydrant Lubricant (in chamber)	Diana 2100
5	Travel Stop Nut	Steel
6	Hold Down Nut	Bronze
7	Hold Down Nut Screw	Steel
8	Bonnet	Ductile Iron
9	Bonnet Locking Screw	Stainless Steel
10	Bonnet Seal	Rubber
11	Hold Down Nut O-ring	Rubber
12	Bonnet – Revolving Nut O-rings	Rubber
13	Revolving Nut	Bronze
14	Inner Revolving Nut O-rings	Rubber
15	Pumper Nozzle	Bronze
16	Pumper Nozzle Cap Gasket	Rubber
17	Pumper Nozzle Cap	Ductile Iron
18	Pumper Nozzle O-ring	Rubber
19	Nozzle Lock	Stainless Steel
20	Hose Nozzle	Bronze
21	Hose Nozzle Cap Gasket	Rubber
22	Hose Nozzle O-ring	Rubber
23	Hose Nozzle Cap	Ductile Iron
23	Chain Assembly	Steel
24	Valve Rod Upper	Steel
25	Standpipe Upper	Ductile Iron
26	Traffic Valve Rod Coupling	Stainless Steel
27	Cotter Pin	Stainless Steel
28	Clevis Pins	Stainless Steel
29	Traffic Flange O-ring	Rubber
30	Traffic Standpipe Coupling Halves	Cast Iron
31	Standpipe Coupling Nuts & Bolts	Stainless Steel
32	Valve Rod Lower	Steel
33	Standpipe Lower	Cast Iron
34	Top Plate Pin - Shear Proof	Stainless Steel
35	Upper Valve Plate	Bronze
36	Drain Valve Facing	Rubber
37	Drain Valve Facing Screw	Stainless Steel
38	Bottom Seat O-ring	Rubber
39	Drain Ring	Bronze
40	Seat Ring	Bronze
41	Drain Ring Housing	Cast Iron
42	Drain Ring Housing O-ring	Rubber
43	Main Valve	Rubber
44	Lower Valve Plate	Cast Iron
45	Cap Chains	Steel
46	Chain Hooks	Steel
47	Upper Stem Pin	Stainless Steel
48	Shoe Bolt and Nut	Steel
49	Shoe	Ductile Iron
50	Top Seat O-ring	Rubber
51	Anti-Friction Bearing	Delrin® 500*
52	Sleeve	Copper
53	Stem O-ring	Rubber

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