

# OPERATION AND MAINTENANCE GUIDE

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## CONTACTING SIGELOCK SYSTEMS

If after reading the following instructions, you have additional questions related to the operation and maintenance of a Sigelock Spartan Fire Hydrant, please call one of the following numbers.

Customers in the continental United States can contact the Direct Response Line at:

516-887-3510

or visit <http://www.spartanfirehydrants.com>

## SPARTAN WARRANTY

Sigelock Systems, LLC warrants the Spartan Dry Barrel Fire Hydrant – Standard Base Model for a period of twenty (25) years from the date of shipment from Sigelock Systems, LLC to be free from defects in material and workmanship under normal and customary use and maintenance, provided the hydrant is installed and maintained according to Sigelock Systems' instructions, and applicable codes. Sigelock Systems, LLC shall have no obligation under this warranty unless it is notified of claims hereunder promptly and in writing upon discovery thereof and within the warranty period.

The foregoing warranty does not cover failure of any part or parts from external forces, including, but not limited to, earthquake, vandalism, vehicular or other impact, application of excessive torque to the operating mechanism or frost heave. Sigelock Systems, LLC shall have the right to inspect said product before it is removed from installation. If the product is removed from installation prior to approval from Sigelock Systems, LLC this warranty shall be void.

Sigelock Systems' sole responsibility under this warranty shall be limited to, at Sigelock Systems' sole discretion, to replace the product with the same or a similar product, repair the product, provide purchasing credit, or refund the price paid for the product provided the product has been properly applied and used under normal service and under conditions for which it is designed. Purchaser shall bear all responsibility and expense incurred for removal, reinstallation and shipping in connection with any part supplied under the foregoing warranty. Sigelock Systems shall not be liable for indirect, special, incidental, or consequential damage, expenses, losses or penalties and does not assume any liability of purchaser to others or to anyone for injury to persons or property.

THIS IS THE EXCLUSIVE WARRANTY GIVEN IN CONNECTION WITH THE SALE OF THIS PRODUCT. THERE ARE NO OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING EXPRESSED OR IMPLIED WARRANTY OF MERCHANTABILITY, OR ANY EXPRESSED OR IMPLIED WARRANTY OF SUITABILITY FOR ANY PARTICULAR PURPOSE, GIVEN BY SIGELOCK SYSTEMS, LLC IN CONNECTION WITH THIS PRODUCT.



### WARNING



Before removing any bolts(s) holding the hydrant together, shut off gate valve to isolate hydrant from main water source. Loosen (do not remove) the pumper nozzle cap by slowly pulling the opening tool wrench downward slightly and check for water under pressure inside hydrant - bleed off any pressure, then remove nozzle cap completely. Open hydrant main seat 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 seat could result in unexpected ejection of hydrant parts, debris or high-pressure water stream, which could cause serious bodily injury.

## INTRODUCTION

This manual applies to all Sigelock Systems 5 ¼ Spartan Fire Hydrants. Sigelock Systems has developed a revolutionary fire hydrant that delivers dependable and reliable operation when the need arises. The Spartan's security design feature is a breakthrough in hydrant technology.

Introduced in 2011, the Spartan hydrant is rated at 300 p.s.i.g. and is seat tested at 600 p.s.i.g. The Spartan meets and exceeds applicable requirements of AWWA C502-05 for dry barrel hydrants.

The Spartan hydrant has all the traditional features you expect from a high quality fire hydrant and more.

This instruction is issued as a recommendation to the customer for the proper use of Sigelock Spartan fire hydrants.



## UL APPROVALS

The Spartan hydrant is listed by Underwriters Laboratories, Inc. as meeting their standard UL 246, eighth edition, Hydrants for Fire-Protection Service. Underwriters Laboratories, Inc. require that we consistently manufacture and test our hydrants in compliance with their stringent requirements. Our facilities are subject to periodic inspections to assure we are in compliance with their standards.



# RECEIVING INSPECTION AND TESTING

Upon receipt, inspect for direction of opening, correct nozzle threads, color, missing parts, and shipping damage. Report any problems to carrier, note on bill of lading and have driver sign your copy.

## Inspection

To ensure their readiness for instantaneous use, it is recommended that Fire Hydrants be inspected and tested at twelve-month intervals. After each use in extremely cold weather, hydrants should be inspected specifically for drainage.

Inspection should cover the following points:

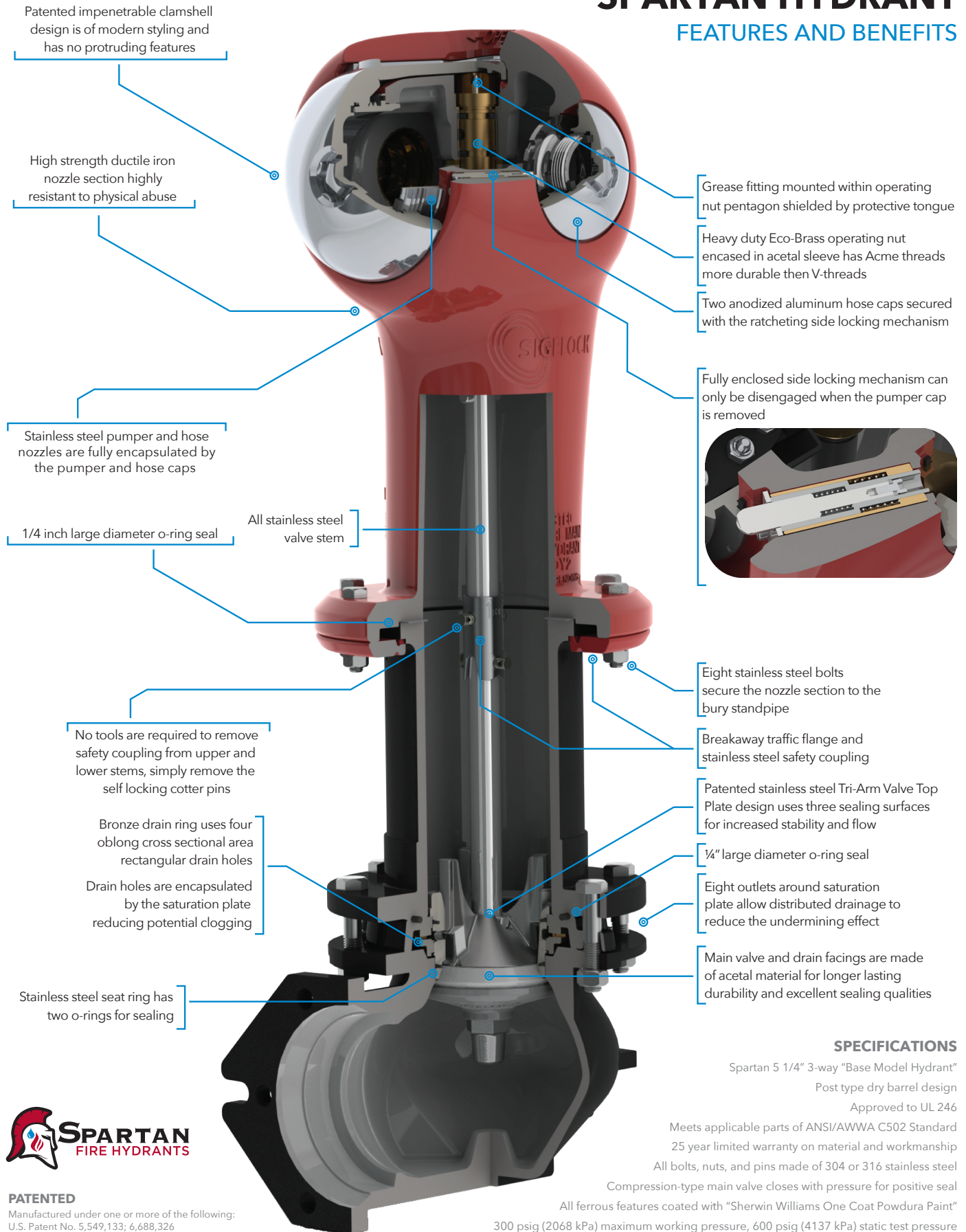
- a. External inspection – paint, caps, etc.
- b. Seat leakage – aquaphone check
- c. Hydrant, drain and nozzle leakage – pressure test of entire hydrant
- d. Hydrant drainage
- e. Operate from full close to full open and re-close.

## Testing

1. Remove pumper nozzle cap using the All-in-One Wrench. Tighten hose nozzle caps with All-in-One Wrench. Stand on the side of hydrant opposite the pumper nozzle. Turn operating nut to fully OPEN position, flush barrel and hydrant lateral. Turn operating nut to fully CLOSED position.
2. Use Sigelock base model pumper cap to seal off pumper nozzle and tighten with All-in-One Wrench. Turn operating nut to fully OPEN position. Check all flange connections for leaks. Turn operating nut to fully CLOSED position.
3. Remove all nozzle caps. Clean and lubricate threads if necessary. Examine inside of barrel to make certain drain ports 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:
  - a. Water table in ground is higher than drains.
  - b. When the 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.
  - c. Drains are stopped by some foreign material.
  - d. Failure to leave cap off of hydrant to allow air to enter so barrel will drain.
4. Return pumper nozzle cap into nozzle section housing and bring to fully locked position. Remove All-in-One Wrench.

# SPARTAN HYDRANT

## FEATURES AND BENEFITS



Patented impenetrable clamshell design is of modern styling and has no protruding features

High strength ductile iron nozzle section highly resistant to physical abuse

Stainless steel pumper and hose nozzles are fully encapsulated by the pumper and hose caps

1/4 inch large diameter o-ring seal

No tools are required to remove safety coupling from upper and lower stems, simply remove the self locking cotter pins

Bronze drain ring uses four oblong cross sectional area rectangular drain holes  
Drain holes are encapsulated by the saturation plate reducing potential clogging

Stainless steel seat ring has two o-rings for sealing

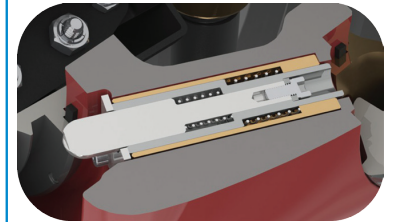
All stainless steel valve stem

Grease fitting mounted within operating nut pentagon shielded by protective tongue

Heavy duty Eco-Brass operating nut encased in acetal sleeve has Acme threads more durable than V-threads

Two anodized aluminum hose caps secured with the ratcheting side locking mechanism

Fully enclosed side locking mechanism can only be disengaged when the pumper cap is removed



Eight stainless steel bolts secure the nozzle section to the bury standpipe

Breakaway traffic flange and stainless steel safety coupling

Patented stainless steel Tri-Arm Valve Top Plate design uses three sealing surfaces for increased stability and flow

1/4" large diameter o-ring seal

Eight outlets around saturation plate allow distributed drainage to reduce the undermining effect

Main valve and drain facings are made of acetal material for longer lasting durability and excellent sealing qualities

### SPECIFICATIONS

Spartan 5 1/4" 3-way "Base Model Hydrant"

Post type dry barrel design

Approved to UL 246

Meets applicable parts of ANSI/AWWA C502 Standard

25 year limited warranty on material and workmanship

All bolts, nuts, and pins made of 304 or 316 stainless steel

Compression-type main valve closes with pressure for positive seal

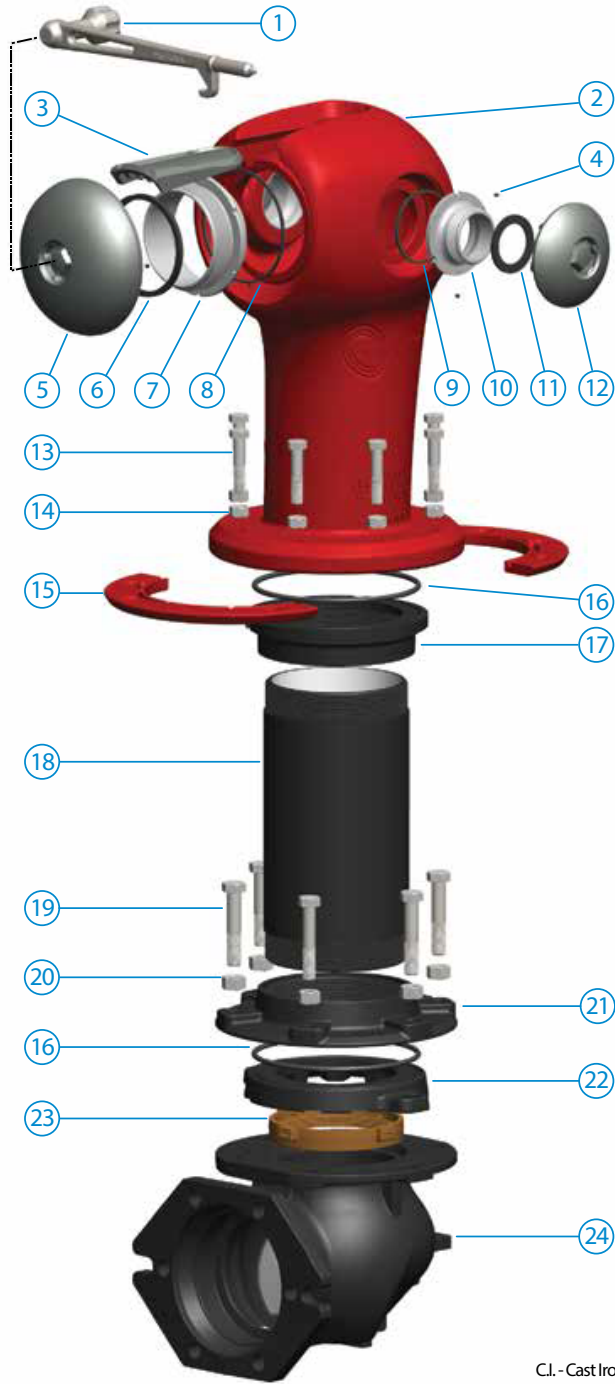
All ferrous features coated with "Sherwin Williams One Coat Powder Paint"

300 psig (2068 kPa) maximum working pressure, 600 psig (4137 kPa) static test pressure



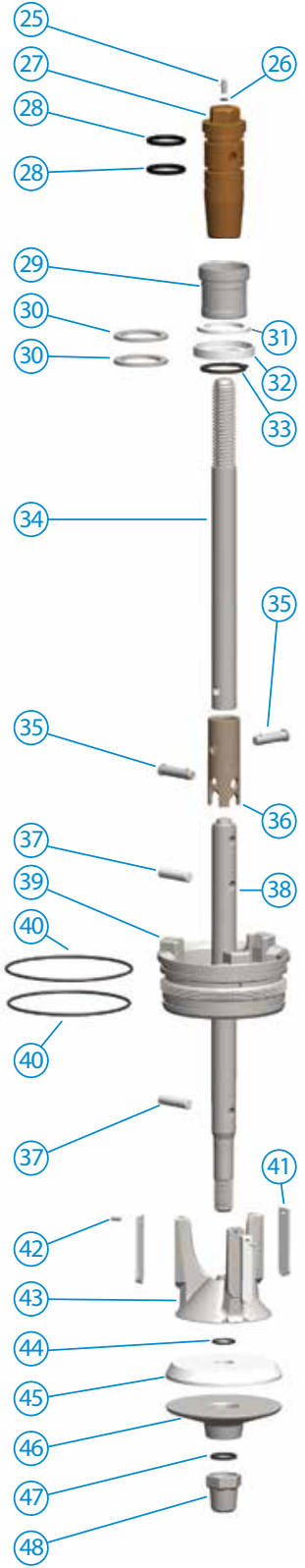
### PATENTED

Manufactured under one or more of the following:  
U.S. Patent No. 5,549,133; 6,688,326



Item No.	QTY	Part Name / Description	Material
1	1	All-In-One Wrench	Stn. Stl.
2	1	Nozzle Housing	D.I.
3	1	Tamper Resistant Tongue	Al Alloy
4	9	Nozzle Set Screw	Stn. Stl.
5	1	Pumper Nozzle Screw Cap	Al Alloy
6	1	Pumper Screw Cap O-ring	EPDM
7	1	Pumper Nozzle	Stn. Stl.
8	1	Pumper Nozzle O-Ring	EPDM
9	2	Hose Nozzle O-Ring	EPDM
10	2	Hose Nozzle	Stn. Stl.
11	2	Hose Nozzle Cap O-ring	EPDM
12	2	Aluminum Hose Nozzle Cap	Al Alloy
13	8	Safety Flange Bolt	Stn. Stl.
14	8	Safety Flange Nut	Stn. Stl.
15	2	Safety Flange	C.I.
16	2	Standpipe O-Ring	EPDM
17	1	Standpipe Upper Flange	D.I.
18	1	Standpipe	D.I.
19	6	Inlet Flange Bolt	Da. Co. Stl.
20	6	Inlet Flange Nut	Da. Co. Stl.
21	1	Standpipe Lower Flange	D.I.
22	1	Saturation Ring	C.I.
23	1	Drain Ring	Eco Brass
24	1	Inlet Elbow	D.I.
25	1	Grease Fitting	Stn. Stl.
26	1	Grease Fitting O-Ring	EPDM
27	1	Operating Nut	Eco Brass
28	2	Operating Nut O-ring	Buna-N
29	1	Operating Nut Sleeve	POM
30	2	Low-Friction Thrust Washer 1	Stn. Stl.
31	1	Low-Friction Thrust Washer 2	POM
32	1	Operating Nut Bearing Washer	POM
33	1	Operating Nut Retain-Ring	Zn.Di.Stl.
34	1	Upper Operating Stem	Stn. Stl.
35	2	Self Locking Cotter Pin	Stn. Stl.
36	1	Safety Coupling	Stn. Stl.
37	2	Grooved Pin	Stn. Stl.
38	1	Lower Operating Stem	Stn. Stl.
39	1	Valve Seat Ring	Stn. Stl.
40	2	Valve Seat Ring O-ring	EPDM
41	3	Drain Valve Facing	POM
42	3	Drain Valve Screw	Stn. Stl.
43	1	Tri-Arm Valve Top Plate	Stn. Stl.
44	1	Main Seat Valve O-ring	EPDM
45	1	Main Seat Valve	POM
46	1	Lower Valve Plate	Stn. Stl.
47	1	Bottom Plate Nut O-Ring	EPDM
48	1	Bottom Plate Nut	Stn. Stl.

C.I. - Cast Iron  
 D.I. - Ductile Iron  
 Stn. Stl. - Stainless Steel  
 Zn. Pl. Stl. - Zinc Plated Steel  
 Bl. Ox. Stl. - Black Oxide Steel  
 Zn.Di.Stl. - Zinc Dichromate Steel  
 Da. Co. Stl. - Dacromet Coated Steel



MANUFACTURED IN FRANKLIN, PA  
**HUB ZONE CERTIFIED**

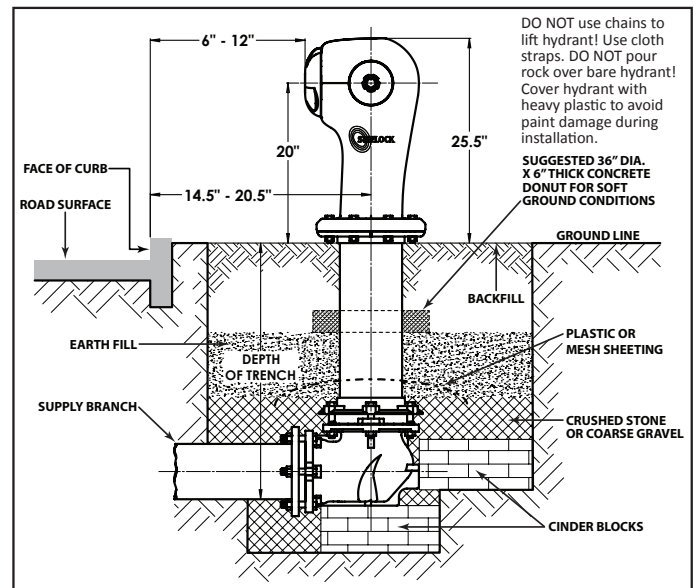
All products must be installed and maintained in accordance with applicable instructions and/or standards.

# INSTALLATION

- When hydrants are received, they should be handled carefully to avoid breakage and damage to flanges. Keep hydrants closed until they are installed. Protect stored hydrants from the elements if possible.
- Before installation of hydrant, clean piping, base and drain ring of hydrant of any foreign material. Check for loose bolts at base, groundline and cover. Tighten if necessary.
- Hydrants shall be located as shown or as directed and in a manner to provide complete accessibility, and also in such a manner that the possibility of damage from vehicles or injury to pedestrians will be minimized. When placed behind the curb, the hydrant barrel shall be set so that no portion of the Pumper or Hose Nozzle Cap will be less than 6 inches, nor no more than 12 inches from the gutter face of the curb. When set in the lawn space between the curb and the sidewalk, or between the sidewalk and the property line, no portion of the hydrant or nozzle cap shall be within 6 inches of the sidewalk.
- All hydrants shall stand plumb and shall have their nozzles parallel with or at right angles to the curb, with the Pumper Nozzle facing the curb. Hydrants shall be set to the established grade, with nozzles at least 20 inches above the ground, as shown or as directed by the engineer.
- It is recommended practice to install an auxiliary or secondary gate valve in the lateral between the hydrant and the main to permit inspection and repair of the hydrant without shutting down mains.
- On traffic hydrants, be sure the earth is firmly compacted around the barrel to support the lower barrel against side loading. If the soil is too sandy and will not support the loads, pour a concrete pad around the barrel at or near the groundline at least 6 inches thick and 36 inches in diameter for barrel support.
- Whenever a hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand, from the bottom of the trench to at least 6 inches above the drain opening in the hydrant and to a distance of 12 inches around the elbow. It is recommended to place plastic or mesh sheathing above the crushed stone and wrapped around the standpipe to prevent soil from settling.
- Whenever a hydrant is set in clay or other impervious soil, a drainage pit 24 inches in diameter and 36 inches deep shall be excavated below each hydrant and filled compactly with coarse gravel or crushed stone mixed with coarse sand under and around the elbow of the hydrant and to a level of 6 inches above the drain opening.
- Restrain hydrant movement with appropriate thrust blocking or restrained joint to prevent pipe joint separation.
- When first installed, the hydrant should be operated from full closed to full open position and back to make sure no obstructions are present.
- After the line as well as the hydrant have been hydrostatically tested, the hydrant should be flushed and then checked for proper drainage.

**IMPORTANT** - Initial installation of hydrant MUST BE MADE PROPERLY so the Sigelock Safety Flange 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.



# SPARTAN TESTING

AWWA C502 permits dry-barrel hydrants with unplugged drain outlets to have an allowable leakage of 5 fluid oz/min (0.25 mL/s) through the drain ports. Therefore, the main seat should not be opened at the same time that the water main is tested. The auxiliary valve should be closed during water main tests (see AWWA C600).

After the hydrant is installed and, when possible, before backfilling (and after pressure testing the water main), the hydrant should be tested as follows:

- a. Pressure Test at Main Pressure
- b. Pressure Test at Pressure Above Main Pressure
- c. Drainage Test for Dry-Barrel Hydrants

## OPERATION AND MAINTENANCE

### Operation

The thrust bearing hydrant requires a minimum of torque to operate. It is possible to damage the hydrant by forcing it beyond its limits of travel with excess torque; therefore:

1. Check direction of opening as marked on the hydrant nozzle section (top).
2. To open, first remove the pumper nozzle cap using the All-in-One Wrench. Using the All-in-One Wrench, turn the operating nut until the seat hits the stop in the opening direction (approximately 15 turns). Do not force the hydrant in the opening direction beyond full open as indicated by sudden resistance to turning. If water does not flow when the hydrant is open, it is probably due to a closed valve upstream from the hydrant.
3. To close, turn the operating nut in the closing direction slowly, to minimize the "water hammer" effect, until the seat stops off the flow. It is not necessary to close this style of hydrant with great force. Once the flow has stopped, loosen the operating nut slightly (1/4 turn) in the opening direction to take the strain off the operating parts of the hydrant and to make it easier to open the hydrant.

### Maintenance

**Note:** Where grease is specified, use Food Grade Silicon Grease.

1. At time of inspection, add grease to the operating nut using the grease fitting located in the center of the pentagon. It will be necessary to remove the pumper nozzle cap in order to expose the operating nut and grease fitting. It is not necessary to disassemble the operating nut from the nozzle section housing unless the operating nut is in need of replacement.
2. If it is desired, add grease to nozzle cap threads with Food Grade Silicon Grease.



## FACING OF HOSE NOZZLES

1. Remove pumper nozzle cap using All-in-One Wrench.
2. Loosen nuts on the safety flange bolts.
3. Turn operating nut slightly in the opening direction to relieve compression between nozzle section housing and standpipe sections.
4. Lift and rotate nozzle section housing as desired.
5. Tighten operating nut, turning in closing direction.
6. Tighten nuts on safety flange bolts.
7. Turn operating nut in closing direction to make sure main seat is closed tightly, then turn in opening direction approximately 1/4 turn to relieve tension on operating mechanism.
8. Return pumper nozzle cap into nozzle section housing, then lock using All-in-One Wrench.



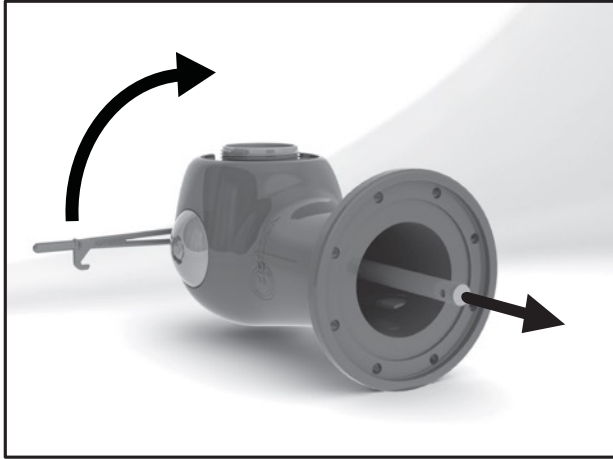
## REPLACING SAFETY FLANGES AND SAFETY COUPLING

Should a hydrant be struck by a vehicle such that the nozzle section housing is severed from the standpipe, the following procedure should be followed to reassemble the hydrant and make it operational. (A traffic damage repair kit for the specific hydrant is required to perform this procedure.)

1. It is necessary to close auxiliary or secondary valve in the lateral to isolate hydrant from the water supply.
2. Inspect the nozzle section housing to determine if any of the components are fractured. Should cracking or fracture of any other component occur, it should be replaced.
3. Remove the broken safety flanges from the nozzle section housing by removing the safety flange bolts. (Note: discard old safety flanges, nuts and bolts.)
4. Remove the broken safety coupling segment from the upper stem by removing the self locking cotter pins and verify that the upper stem is undamaged. (Note: discard old self locking cotter pins.)
5. Inspect the standpipe and clean any dirt or debris from the gasket seating surface.
6. Use the All-In-One Wrench to remove the pumper cap from nozzle section housing.

(Note: It is recommended that the hydrant be firmly secured before attempting to remove the pumper cap while the hydrant is on the ground.)

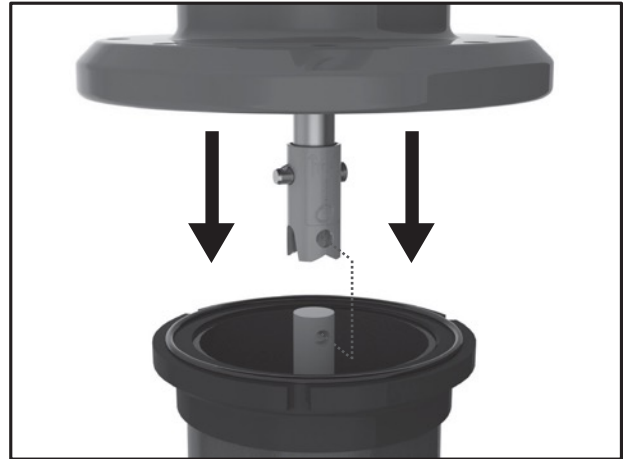
7. Turn the operating nut, while holding the upper stem until the stem lowers a few inches below the hydrant flange; this will extend the upper stem and ease the replacement of the new safety coupling.



8. Remove the self locking cotter pin from the lower stem and verify that the stem end will receive the new safety coupling. (Note: Discard old self locking cotter pin.) (Note: If the lower stem will not receive a new safety coupling, the main seat assembly must be removed and the lower stem will need to be replaced, see Removing Main Seat from Lower Barrel, Page 12)
9. Orient the new safety coupling such that the end with the arrows and word "TOP" is placed on the upper stem such that the hole in the safety coupling aligns with the hole on the upper stem. Lock the safety coupling in place with new stainless steel self locking cotter pin.



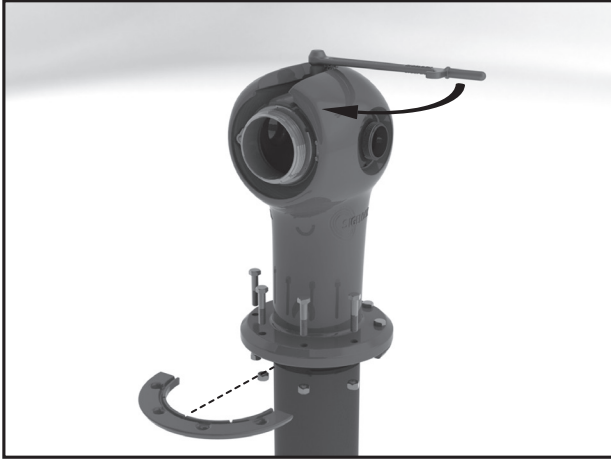
11. Lift the nozzle section housing assembly and position it over the standpipe section. (Note: It is recommended that the nozzle section housing assembly be lifted with the assistance of a stable boom arm capable of securely lifting 200 lbs. It will be necessary to remove both hose caps so that a strap can be fed through the nozzle section housing.) Align the safety coupling on the upper stem with the lower stem such that the bottom hole in the coupling aligns with the top hole on the lower stem.



12. Slide the safety coupling over the lower stem and insert new stainless steel self locking cotter pin. (Note: Once the safety coupling is lowered near the lower stem, it is easiest to do any incremental adjustments by turning the operating nut respectively.)
13. Rotate the hydrant to position the pumper and hose nozzles in the desired orientation to the curb. Lower the nozzle section housing until the flange is resting on the standpipe. Be careful to position the standpipe gasket to achieve full coverage of the end faces of the flange and standpipe. (Note: While lowering the nozzle section housing onto the standpipe, a pinch point exists. Keep fingers clear!)



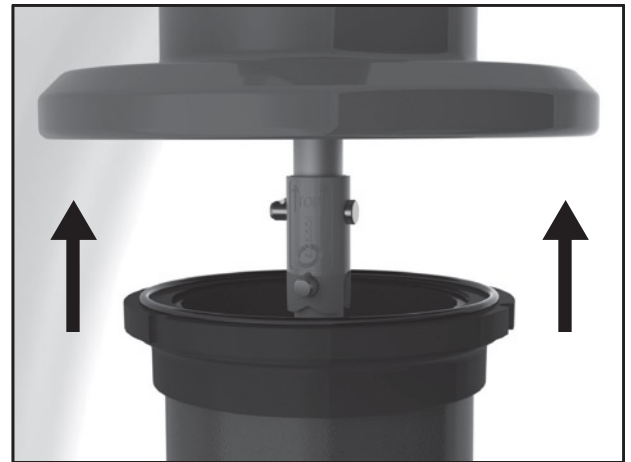
14. Turn the operating nut in the closing direction to bring the upper and lower sections together. Then install new safety flanges from the repair kit by positioning them under the lip at the top of the standpipe and bolting them to the nozzle section housing with the supplied stainless steel bolts and nuts. The safety flanges should be installed so that the markings are facing upward with one flange for the front section and one flange for the rear section.



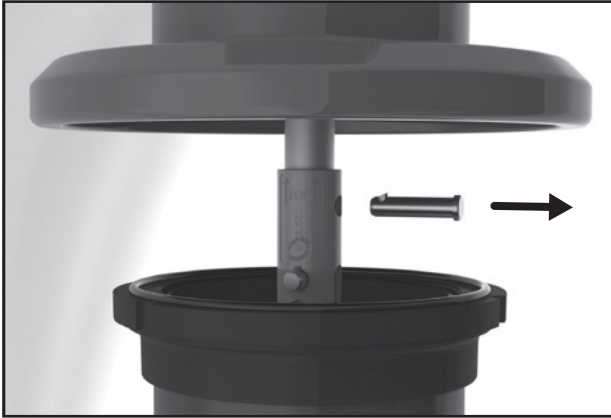
15. After nuts have been started on all bolts, tighten the flange bolts in an alternating pattern to a torque value of between 100 and 120 ft.-lbs.
16. Once the hydrant has been reassembled, it is essential that it be operated to determine that it is fully functional. Turn on water at the auxiliary or secondary valve.
17. After operation testing is completed, turn operating nut in closing direction to make sure main seat is closed tightly, then turn in opening direction approximately  $\frac{1}{4}$  turn to relieve tension on operating mechanism. Return all pumper and hose caps.

## REMOVING MAIN SEAT FROM STANDPIPE

1. Shut off water at the auxiliary or secondary valve.
2. Remove the pumper cap using the All-In-One Wrench. Once the pumper cap has been removed, remove the hose caps using the All-In-One Wrench.
3. Open the hydrant until it bottoms out by turning the operating nut in the OPEN direction.
4. Remove safety flange bolts and safety flanges.
5. Lift nozzle section housing. (Note: It is recommended that the nozzle section housing assembly be lifted with the assistance of a stable boom arm capable of securely lifting 200 lbs. It will be necessary to remove both hose caps so that a strap can be fed through the nozzle section housing.)



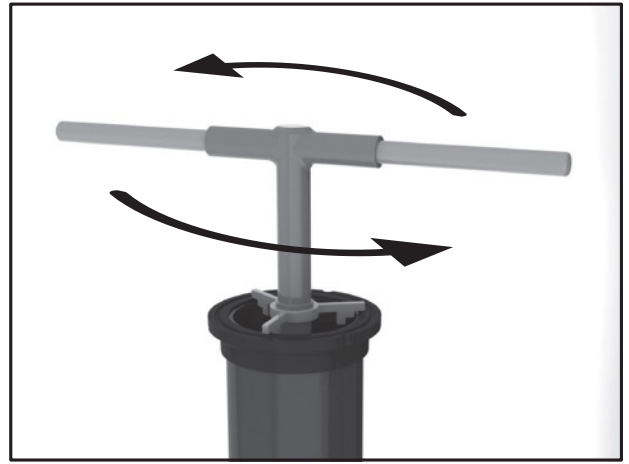
- Once the nozzle section housing assembly is elevated to a suitable distance from the standpipe, about 4", remove self locking cotter pin from the upper stem. (Note: Make sure the upper and lower stems are not in tension when attempting to remove the cotter pin by turning the operating nut appropriately.)



- Completely remove nozzle section housing assembly from standpipe. (Note: When setting the hydrant, it is first recommended to turn the upper stem by hand in the closing direction in order to raise the stem so that the hydrant will not tip over when it is set on the ground.)



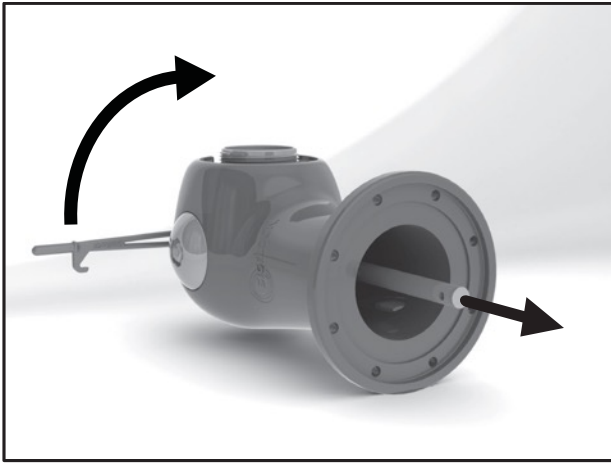
- Remove standpipe o-ring from standpipe. Remove self locking cotter pin from the lower stem and remove safety coupling.
- Slide the slotted end of Seat Wrench over the lower stem. Align slots in wrench so that the grooved pin in the lower stem will slide through the slots. Place the guides of the Seat Wrench into the top of the standpipe for stability.
- Remove main seat assembly by turning the Seat Wrench anti-clockwise to unthread the seat ring. Lift out Seat Wrench, lower stem, main seat assembly and seat ring from hydrant standpipe.



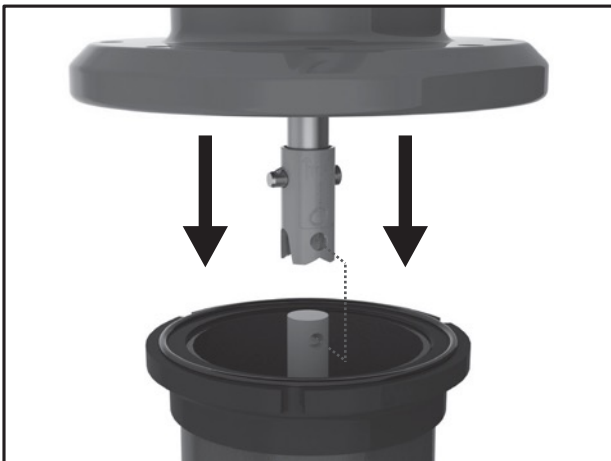
- To disassemble lower seat assembly, unscrew bottom plate nut and remove bottom plate nut o-ring, lower seat plate, main seat, seat ring and tri-arm top plate. Clean, inspect and replace any damaged parts. Inspect and lubricate top and bottom seat ring o-rings (replace if necessary). Lubricate all threaded surfaces and reassemble, with bottom plate nut tightened to 100 ft-lbs.



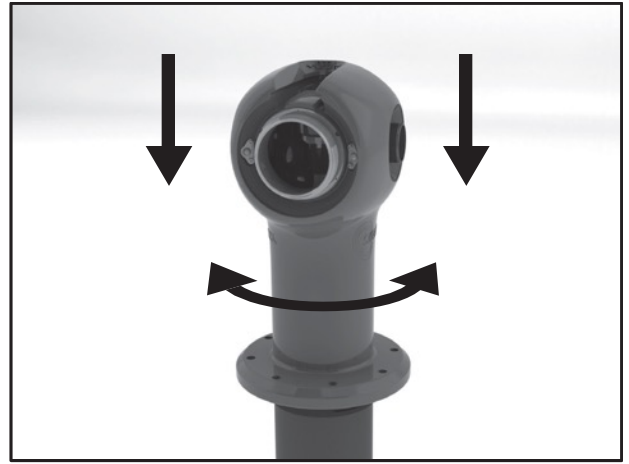
- Lower main seat Assembly and carefully thread seat ring into the drain ring at the base of the hydrant hand-tight. Raise the main seat assembly leaving about 1/2" of play between the main seat and lower seat. Lower Seat Wrench over the lower stem. Place the guides of the Seat Wrench into the top of the standpipe for stability.
- Tighten main seat to 200 ft-lbs. Remove Seat Wrench.
- Turn the operating nut, while holding the upper stem until the stem lowers a few inches, about 4", below the hydrant flange; this will extend the upper stem and ease the alignment of the safety coupling with the lower stem.



15. Re-attach the safety coupling onto the lower stem and align it with the lower stem such that the bottom hole in the coupling aligns with the top hole on the lower stem.
16. Lift nozzle section housing assembly and position it over the standpipe section. (Note: It is recommended that the nozzle section housing assembly be lifted with the assistance of a stable boom arm capable of securely lifting 200 lbs. It will be necessary to remove both hose caps so that a strap can be fed through the nozzle section housing.)



17. Slide the lower stem into the safety coupling and insert stainless steel self locking cotter pin. (Note: Once the lower stem is lowered near the safety coupling, it is easiest to do any incremental adjustments by turning the operating nut respectively.)
18. Rotate the hydrant to position the pumper and hose nozzles in the desired orientation to the curb. Lower the nozzle section housing until the flange is resting on the standpipe. Be careful to position the standpipe o-ring to achieve full coverage of the end faces of the flange and standpipe. (Note: While lowering the nozzle section housing onto the standpipe, a pinch point exists. Keep fingers clear!)



19. Turn the operating nut in the closing direction to bring the upper and lower sections together. Then install new safety flanges from the repair kit by positioning them under the lip at the top of the standpipe and bolting them to the nozzle section housing with the supplied stainless steel bolts and nuts. The safety flanges should be installed so that the markings are facing upward with one flange for the front section and one flange for the rear section.



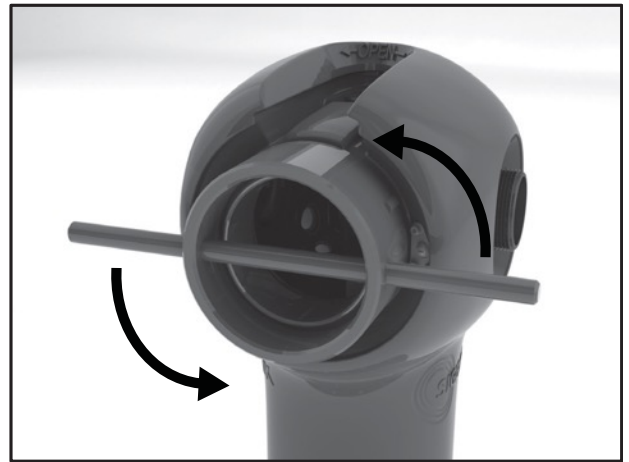
20. After nuts have been started on all bolts, tighten the flange bolts in an alternating pattern to a torque value of between 100 and 120 ft.-lbs.
21. Once the hydrant has been reassembled, it is essential that it be operated to determine that it is fully functional. Turn on water at the auxiliary or secondary valve.
22. After operation testing is completed, turn operating nut in closing direction to make sure main seat is closed tightly, then turn in opening direction approximately 1/4 turn to relieve tension on operating mechanism. Return all pumper and hose caps.

## REPLACING NOZZLES

1. Remove pumper nozzle cap using the All-In-one Wrench. (Remove hose caps if necessary using All-In-One Wrench.)
2. Remove the three nozzle set screws from the respective nozzle using a 1/8" hex drive or Allen key.



3. Place respective Nozzle Wrench over nozzle with wrench forks facing toward nozzle section housing and lock into nozzle drive lugs. Turn anti-clockwise to loosen and remove nozzle from nozzle section housing.



4. Inspect new nozzle and lubricate O-Ring.
5. Thread new nozzle into nozzle section housing, attach Nozzle Wrench as described in Step 3, and tighten nozzle to approximately 600 ft-lbs torque (100 lbs. pull on a 6' lever).
6. Tighten the three nozzle set screws in the nozzle using a 1/8" hex drive or Allen key hand-tight.
7. Return all pumper and hose caps.

## CHANGING INLET ELBOW

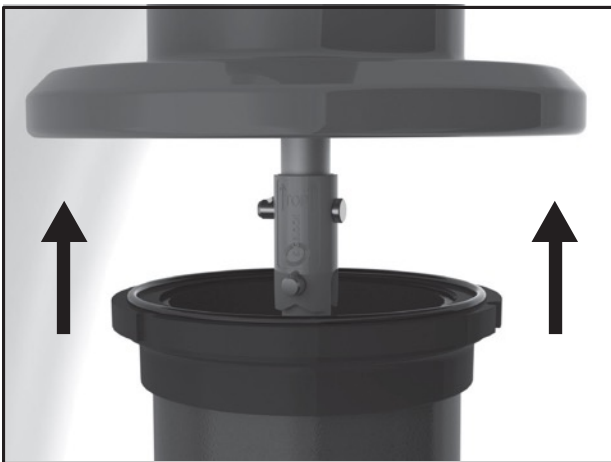
1. Remove pumper cap using the All-In-One Wrench.
2. Tighten operating nut Using All-In-One Wrench to be sure main seat is in the fully closed position.
3. Remove all 6 inlet flange bolt nuts.
3. Slip off inlet elbow.
4. Lubricate new inlet elbow and seat ring o-ring.
5. Position inlet elbow to slip in place.
6. Slip new inlet elbow in place being careful not to damage seat ring o-ring.
7. Replace all 6 inlet flange bolt nuts. Tighten to approximately 125 - 165 ft-lbs.

# INSERTING EXTENSION SECTION

1. Shut off water at the auxillary or secondary valve.
2. Remove the pumper cap using the All-In-One Wrench. Once the pumper cap has been removed, remove the hose caps using the All-In-One Wrench.
3. Open the hydrant until it bottoms out by turning the operating nut in the OPEN direction.

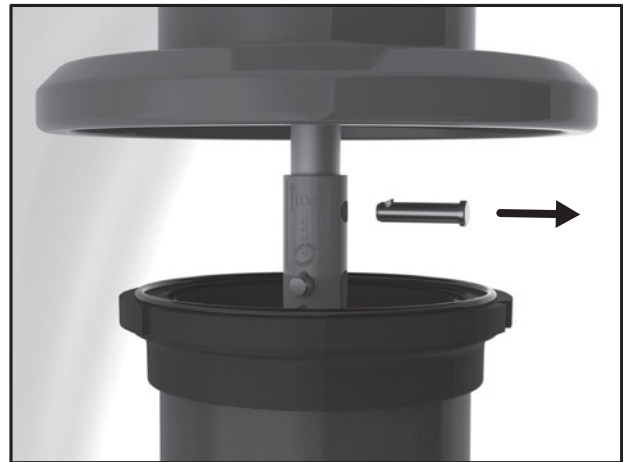


4. Remove safety flange bolts and safety flanges.
5. Lift nozzle section housing. (Note: It is recommended that the nozzle section housing assembly be lifted with the assistance of a stable boom arm capable of securely lifting 200 lbs. It will be necessary to remove both hose caps so that a strap can be fed through the nozzle section housing.)



6. Once the nozzle section housing assembly is elevated to a suitable distance from the standpipe, about 4", remove self locking cotter pin from the upper valve remove self locking cotter pin from the upper stem.

(Note: Make sure the upper and lower stems are not in tension when attempting to remove the cotter pin by turning the operating nut appropriately.)



7. Completely remove nozzle section housing assembly from standpipe. (Note: When setting the hydrant, it is first recommended to turn the upper stem by hand in the closing direction in order to raise the stem so that the hydrant will not tip over when it is set on the ground.)

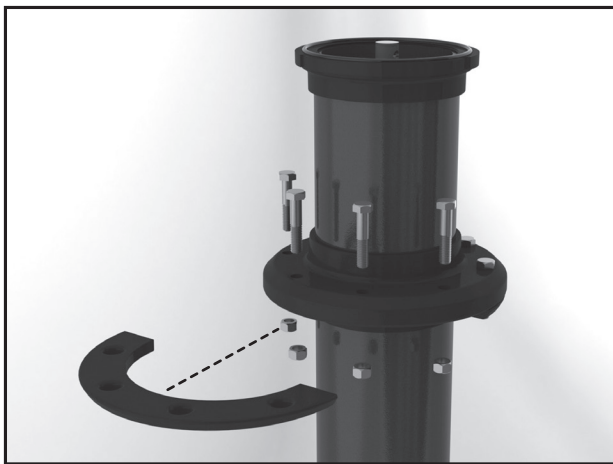


8. Place extension stem and extension coupling on lower stem and retain it with stainless steel self locking cotter pin.

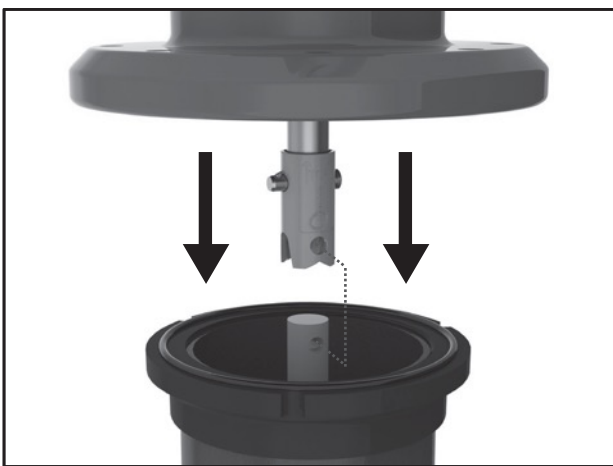


12. Slide the lower stem into the safety coupling and insert stainless steel self locking cotter pin. (Note: Once the lower stem is lowered near the safety coupling, it is easiest to do any incremental adjustments by turning the operating nut respectively.)

13. Rotate the hydrant to position the pumper and hose nozzles in the desired orientation to the curb. Lower the nozzle section housing until the flange is resting on the standpipe. Be careful to position the standpipe o-ring to achieve full coverage of the end faces of the flange and standpipe. (Note: While lowering the nozzle section housing onto the standpipe, a pinch point exists. Keep fingers clear!)



14. Turn the operating nut in the closing direction to bring the upper and lower sections together. Then install new safety flanges from the repair kit by positioning them under the lip at the top of the standpipe and bolting them to the nozzle section housing with the supplied stainless steel bolts and nuts. The safety flanges should be installed so that the markings are facing upward with one flange for the front section and one flange for the rear section.





15. After nuts have been started on all bolts, tighten the flange bolts in an alternating pattern to a torque value of between 100 and 120 ft.-lbs.
16. Once the hydrant has been reassembled, it is essential that it be operated to determine that it is fully functional. Turn on water at the auxillary or secondary valve.
17. After operation testing is completed, turn operating nut in closing direction to make sure main valve is closed tightly, then turn in opening direction approximately ¼ turn to relieve tension on operating mechanism. Return all pumper and hose caps.

## SPARTAN TROUBLE SHOOTING GUIDE

### Problem

1. Operating nut turns freely but hydrant does not open.
2. Ground around hydrant is highly saturated.
3. External leakage is noticed around the operating nut.
4. Operating nut is extremely hard to turn.
5. Water is dripping around nozzles.
6. Hydrant will not drain properly.

### Solution

1. Inspect safety coupling for breakage and insure lower pins are properly installed.
2. Remove pumper nozzle cap and close hydrant. Check with listening device to determine if water is passing by main seat. If it is determined that the main seat is leaking, try the following:
  - a. Flush hydrant in fully open position (watch to see if rocks or other foreign objects flush out of the barrel).
  - b. After flushing for several minutes, shut off the hydrant. Watch for several minutes to see if flow stops. Place hand over open Pumper Nozzle; suction should be felt, indicating hydrant is no longer leaking and drains are working properly.
  - c. If flushing does not solve the problem, it would indicate that something is trapped or has damaged the main seat. Follow the seat removing instructions to replace the seat.
  - d. Check threads on bronze seat to be sure that it is not damaged. If threads appear worn or bent, replace the bronze seat.
  - e. If replacing the seat does not stop the leakage, bolting at the hydrant shoe may be loose or the base gasket is damaged. The hydrant must be excavated to make the repair.
3. This indicates that o-rings are cut or missing. O-rings can be replaced without shutting off the water. See repair section of the manual for proper replacement.
4. Replace the thrust washers in the hydrant head. If this does not solve the problem, remove the hydrant seat and flush thoroughly. Note: Where grease is specified, use Mystik FG-2 Food Machinery Grease.
5. Close hydrant and remove pumper and hose nozzle caps and replace cap gaskets. Check the nozzle to be sure that it is properly installed. Hydrants have an o-ring behind the nozzle. If leakage is coming from behind the nozzle, replace the o-ring.
6.
  - a. Check to be sure the water table has not risen too high to allow for drainage.
  - b. Flush hydrant to be sure drains are clear.
  - c. Open hydrant slowly several turns while leaving caps firmly in place to insure hydrant drains are clear. Close hydrant and repeat this procedure.
  - d. Do this slowly three or four times. If this does not solve the problem, remove the hydrant seat assembly and check the drain facings. If no problems are found, excavate the hydrant to see if concrete or other materials have blocked the drain holes.

## REMOVING A VALVE FOR REPLACEMENT

1. With the upper stem already removed and using the extension tool provided, line up the lower hole in the coupling to the hole in the lower stem.



2. Lock the coupling to the lower stem using the pin.



3. Turn counter clockwise to loosen and spin out to release the valve.



4. Upon removal, you can see your top plate, bottom plate, and valve seat ring.



5. At this time, do any repairs to your o-rings or valve seat. Use a lot of silicone on the o-rings before putting it back in.



6. Slide the valve back into the housing and line it up.



7. Thread it carefully without forcing. This is a brass drain ring and a stainless steel valve seat ring.



8. The ears on the top plate will grab and allow you to spin it in. Once it locks, you'll know it's in securely.



9. Remove the pin. Put the upper stem back on. Then put the bonnet back on.



## Notes

1. Size and shape of threading on nozzles and caps, and the direction of opening made to specifications.
2. All ductile iron is ASTM A-536 Grade 65-45-12.
3. All gray iron is ASTM A-126 Grade 30 & 40.
4. Bolts and nuts are 18-8 stainless steel.
5. Working pressure 300 p.s.i.g., test pressure 600 p.s.i.g.
6. Hydrant conforms to applicable AWWA specifications C502.
7. Nozzle section housing assembly can be rotated 360 degrees.
8. Underwriters Laboratories Listed at 300 p.s.i.g.
9. Bronze in contact with water contains less than 16 percent zinc.
10. Nominal turns to open is 15.



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