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SIGELOCK SPARTAN FIRE HYDRANT

Operation and
Maintenance Guide

Sigelock Systems, LLC
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East Rockaway, NY 11518
sigelock.com

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:

1-888-SIGELOCK (744-3562)

Or visit <http://www.sigelock.com/>

WARRANTY

SIGELOCK SYSTEMS FIFTEEN (15) YEAR WARRANTY DRY BARREL FIRE HYDRANTS

Sigelock Systems, LLC warrants all models of Spartan Dry Barrel Fire Hydrants to be free from defects in material and workmanship under normal and customary use and maintenance for a period of fifteen (15) years from the date of shipment from Sigelock Systems, 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, LLC will honor all reasonable costs to repair or replace any Sigelock Systems Spartan Dry Barrel Fire Hydrant unit found to be defective.

Sigelock System's sole responsibility shall be, in its 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 purchase 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 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.

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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 250 p.s.i.g. and is seat tested at 500 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. The Spartan hydrant is also listed by Underwriters Laboratories, Inc. as meeting their standard **UL 246B**, first edition, The Tamper Resistant Features of 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. Valve 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 Sigelock *Opening Tool* and *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* (separate) 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 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:

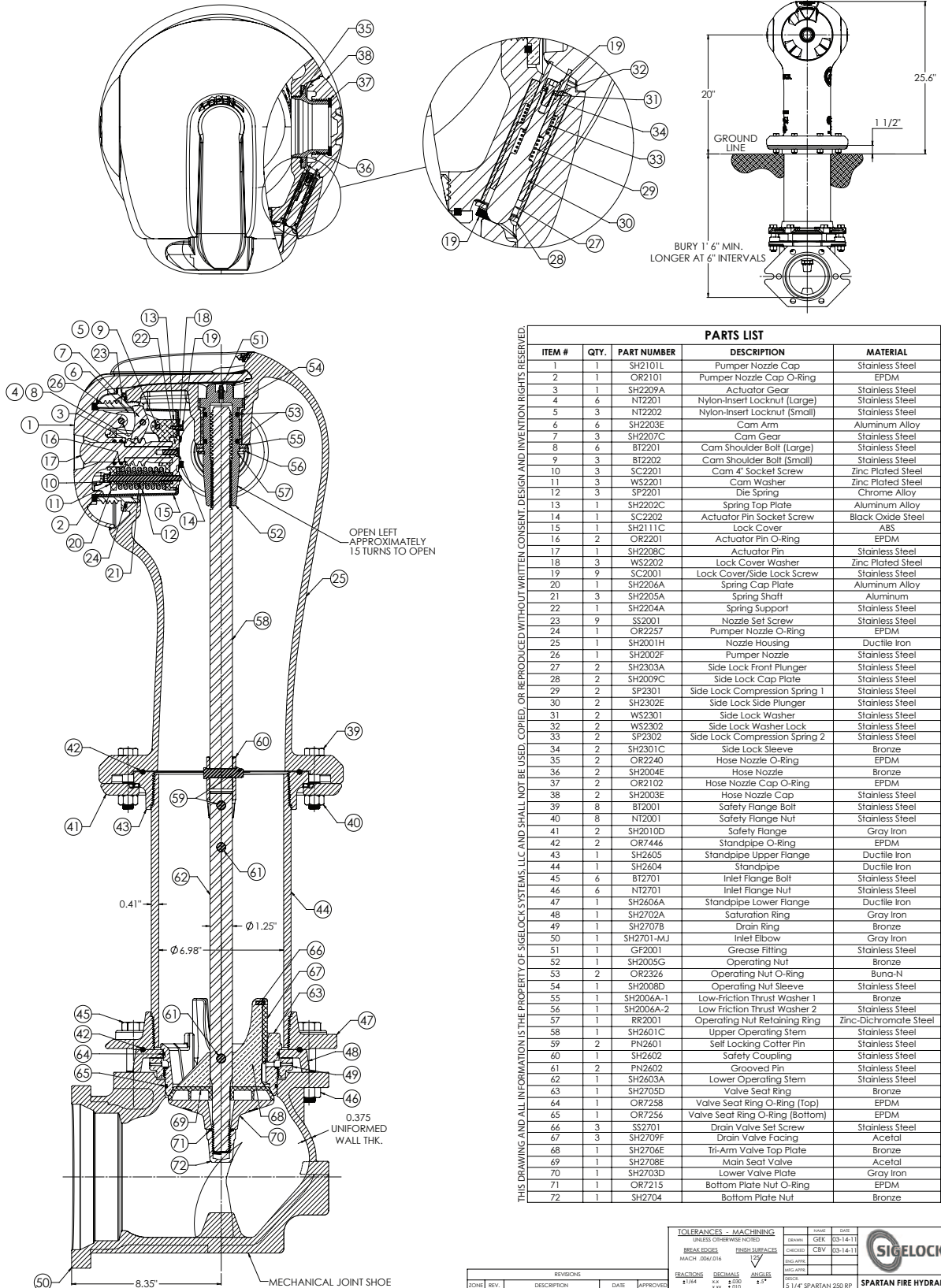
- a. Water table in ground is higher than drains.
- b. When the hydrant was installed, coarse gravel was not placed around drains, in locations where ground has a make up such that it will not absorb water.
- c. Drains are stopped by some foreign material.
- d. Failure to leave cap off of hydrant to 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* and disengage *Opening Tool*.

DIAGRAMS

SCHEMATIC

DWG. SH2000



NOTE: SHOE SIZE AND THREADING OF NOZZLES IS PER CUSTOMER SPECS.

PARTS LIST				
ITEM #	QTY.	PART NUMBER	DESCRIPTION	MATERIAL
1	1	SH2101L	Pumper Nozzle Cap	Stainless Steel
2	1	OR2101	Pumper Nozzle Cap O-Ring	EPDM
3	1	SH2209A	Actuator Gear	Stainless Steel
4	6	NT2201	Nylon-Insert Locknut (Large)	Stainless Steel
5	3	NT2202	Nylon-Insert Locknut (Small)	Stainless Steel
6	6	SH2203E	Cam Arm	Aluminum Alloy
7	3	SH2207C	Cam Gear	Stainless Steel
8	6	BT2201	Cam Shoulder Bolt (Large)	Stainless Steel
9	3	BT2202	Cam Shoulder Bolt (Small)	Stainless Steel
10	3	SC2201	Cam 4" Socket Screw	Zinc Plated Steel
11	3	VS2201	Cam Washer	Zinc Plated Steel
12	3	SP2201	Die Spring	Chrome Alloy
13	1	SH2202C	Spring Top Plate	Aluminum Alloy
14	1	SC2202	Actuator Pin Socket Screw	Black Oxide Steel
15	1	SH2111C	Lock Cover	ABS
16	2	OR2201	Actuator Pin O-Ring	EPDM
17	1	SH2208C	Actuator Pin	Stainless Steel
18	3	WS2202	Lock Cover Washer	Zinc Plated Steel
19	9	SC2001	Lock Cover/Side Lock Screw	Stainless Steel
20	1	SH2206A	Spring Cap Plate	Aluminum Alloy
21	3	SH2205A	Spring Shaft	Aluminum
22	1	SH2204A	Spring Support	Stainless Steel
23	9	SS2001	Nozzle Set Screw	Stainless Steel
24	1	OR2257	Pumper Nozzle O-Ring	EPDM
25	1	SH2001H	Nozzle Housing	Ductile Iron
26	1	SH2002F	Pumper Nozzle	Stainless Steel
27	2	SH2303A	Side Lock Front Plunger	Stainless Steel
28	2	SH2009C	Side Lock Cap Plate	Stainless Steel
29	2	SP2301	Side Lock Compression Spring 1	Stainless Steel
30	2	SH2302E	Side Lock Side Plunger	Stainless Steel
31	2	WS2301	Side Lock Washer	Stainless Steel
32	2	WS2302	Side Lock Washer Lock	Stainless Steel
33	2	SP2302	Side Lock Compression Spring 2	Stainless Steel
34	2	SH2301C	Side Lock Sleeve	Bronze
35	2	OR2240	Hose Nozzle O-Ring	EPDM
36	2	SH2004E	Hose Nozzle	Bronze
37	2	OR2102	Hose Nozzle Cap O-Ring	EPDM
38	2	SH2003E	Hose Nozzle Cap	Stainless Steel
39	8	BT2001	Safety Flange Bolt	Stainless Steel
40	8	NT2001	Safety Flange Nut	Stainless Steel
41	2	SH2010D	Safety Flange	Gray Iron
42	2	OR7446	Standpipe O-Ring	EPDM
43	1	SH2605	Standpipe Upper Flange	Ductile Iron
44	1	SH2604	Standpipe	Ductile Iron
45	6	BT2701	Inlet Flange Bolt	Stainless Steel
46	6	NT2701	Inlet Flange Nut	Stainless Steel
47	1	SH2606A	Standpipe Lower Flange	Ductile Iron
48	1	SH2702A	Saturation Ring	Gray Iron
49	1	SH2707B	Drain Ring	Bronze
50	1	SH2701-MJ	Inlet Elbow	Gray Iron
51	1	GF2001	Grease Fitting	Stainless Steel
52	1	SH2005G	Operating Nut	Bronze
53	2	OR2326	Operating Nut O-Ring	Buna-N
54	1	SH2008D	Operating Nut Sleeve	Stainless Steel
55	1	SH2006A-1	Low-Friction Thrust Washer 1	Bronze
56	1	SH2006A-2	Low Friction Thrust Washer 2	Stainless Steel
57	1	RR2001	Operating Nut Retaining Ring	Zinc-Dichromate Steel
58	1	SH2601C	Upper Operating Stem	Stainless Steel
59	2	PN2601	Self Locking Cotter Pin	Stainless Steel
60	1	SH2602	Safety Coupling	Stainless Steel
61	2	PN2602	Grooved Pin	Stainless Steel
62	1	SH2603A	Lower Operating Stem	Stainless Steel
63	1	SH2705D	Valve Seat Ring	Bronze
64	1	OR7258	Valve Seat Ring O-Ring (Top)	EPDM
65	1	OR7256	Valve Seat Ring O-Ring (Bottom)	EPDM
66	3	SS2701	Drain Valve Set Screw	Stainless Steel
67	3	SH2709F	Drain Valve Facing	Acetal
68	1	SH2706E	Tri-Arm Valve Top Plate	Bronze
69	1	SH2708E	Main Seat Valve	Acetal
70	1	SH2703D	Lower Valve Plate	Gray Iron
71	1	OR7215	Bottom Plate Nut O-Ring	EPDM
72	1	SH2704	Bottom Plate Nut	Bronze

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TOLERANCES - MACHINING		FINISH	DATE
UNLESS OTHERWISE NOTED		CHECKED	03-14-11
BREAK EDGES	FINISH SURFACES	DESIGNED	CBV
MACH. DIMS ±0.016	FINISH SURFACES ±0.005	DATE	03-14-11
ANGLES	ANGLES	REV. APPR.	
1/16" ±0.003	1/16" ±0.003		
1/32" ±0.001	1/32" ±0.001		
3/64" ±0.001	3/64" ±0.001		
1/8" ±0.003	1/8" ±0.003		
1/4" ±0.005	1/4" ±0.005		
1/2" ±0.010	1/2" ±0.010		
3/4" ±0.015	3/4" ±0.015		
1" ±0.020	1" ±0.020		
1 1/4" ±0.030	1 1/4" ±0.030		
1 1/2" ±0.040	1 1/2" ±0.040		
2" ±0.050	2" ±0.050		
3" ±0.075	3" ±0.075		
4" ±0.100	4" ±0.100		
5" ±0.125	5" ±0.125		
6" ±0.150	6" ±0.150		
8" ±0.200	8" ±0.200		
10" ±0.250	10" ±0.250		
12" ±0.300	12" ±0.300		
15" ±0.375	15" ±0.375		
20" ±0.500	20" ±0.500		
25" ±0.625	25" ±0.625		
30" ±0.750	30" ±0.750		
36" ±0.900	36" ±0.900		
42" ±1.050	42" ±1.050		
48" ±1.200	48" ±1.200		
54" ±1.350	54" ±1.350		
60" ±1.500	60" ±1.500		
72" ±1.800	72" ±1.800		
90" ±2.250	90" ±2.250		
108" ±2.700	108" ±2.700		
126" ±3.150	126" ±3.150		
144" ±3.600	144" ±3.600		
162" ±4.050	162" ±4.050		
180" ±4.500	180" ±4.500		
216" ±5.400	216" ±5.400		
252" ±6.300	252" ±6.300		
288" ±7.200	288" ±7.200		
324" ±8.100	324" ±8.100		
360" ±9.000	360" ±9.000		
432" ±10.800	432" ±10.800		
504" ±12.600	504" ±12.600		
576" ±14.400	576" ±14.400		
648" ±16.200	648" ±16.200		
720" ±18.000	720" ±18.000		
864" ±21.600	864" ±21.600		
1008" ±25.200	1008" ±25.200		
1152" ±28.800	1152" ±28.800		
1296" ±32.400	1296" ±32.400		
1440" ±36.000	1440" ±36.000		
1584" ±39.600	1584" ±39.600		
1728" ±43.200	1728" ±43.200		
1872" ±46.800	1872" ±46.800		
2016" ±50.400	2016" ±50.400		
2160" ±54.000	2160" ±54.000		
2304" ±57.600	2304" ±57.600		
2448" ±61.200	2448" ±61.200		
2592" ±64.800	2592" ±64.800		
2736" ±68.400	2736" ±68.400		
2880" ±72.000	2880" ±72.000		
3024" ±75.600	3024" ±75.600		
3168" ±79.200	3168" ±79.200		
3312" ±82.800	3312" ±82.800		
3456" ±86.400	3456" ±86.400		
3600" ±90.000	3600" ±90.000		
3744" ±93.600	3744" ±93.600		
3888" ±97.200	3888" ±97.200		
4032" ±100.800	4032" ±100.800		
4176" ±104.400	4176" ±104.400		
4320" ±108.000	4320" ±108.000		
4464" ±111.600	4464" ±111.600		
4608" ±115.200	4608" ±115.200		
4752" ±118.800	4752" ±118.800		
4896" ±122.400	4896" ±122.400		
5040" ±126.000	5040" ±126.000		
5184" ±129.600	5184" ±129.600		
5328" ±133.200	5328" ±133.200		
5472" ±136.800	5472" ±136.800		
5616" ±140.400	5616" ±140.400		
5760" ±144.000	5760" ±144.000		
5904" ±147.600	5904" ±147.600		
6048" ±151.200	6048" ±151.200		
6192" ±154.800	6192" ±154.800		
6336" ±158.400	6336" ±158.400		
6480" ±162.000	6480" ±162.000		
6624" ±165.600	6624" ±165.600		
6768" ±169.200	6768" ±169.200		
6912" ±172.800	6912" ±172.800		
7056" ±176.400	7056" ±176.400		
7200" ±180.000	7200" ±180.000		
7344" ±183.600	7344" ±183.600		
7488" ±187.200	7488" ±187.200		
7632" ±190.800	7632" ±190.800		
7776" ±194.400	7776" ±194.400		
7920" ±198.000	7920" ±198.000		
8064" ±201.600	8064" ±201.600		
8208" ±205.200	8208" ±205.200		
8352" ±208.800	8352" ±208.800		
8496" ±212.400	8496" ±212.400		
8640" ±216.000	8640" ±216.000		
8784" ±219.600	8784" ±219.600		
8928" ±223.200	8928" ±223.200		
9072" ±226.800	9072" ±226.800		
9216" ±230.400	9216" ±230.400		
9360" ±234.000	9360" ±234.000		
9504" ±237.600	9504" ±237.600		
9648" ±241.200	9648" ±241.200		
9792" ±244.800	9792" ±244.800		
9936" ±248.400	9936" ±248.400		
10080" ±252.000	10080" ±252.000		
10224" ±255.600	10224" ±255.600		
10368" ±259.200	10368" ±259.200		
10512" ±262.800	10512" ±262.800		
10656" ±266.400	10656" ±266.400		
10800" ±270.000	10800" ±270.000		
10944" ±273.600	10944" ±273.600		
11088" ±277.200	11088" ±277.200		
11232" ±280.800	11232" ±280.800		
11376" ±284.400	11376" ±284.400		
11520" ±288.000	11520" ±288.000		
11664" ±291.600	11664" ±291.600		
11808" ±295.200	11808" ±295.200		
11952" ±298.800	11952" ±298.800		
12096" ±302.400	12096" ±302.400		
12240" ±306.000	12240" ±306.000		
12384" ±309.600	12384" ±309.600		
12528" ±313.200	12528" ±313.200		
12672" ±316.800	12672" ±316.800		
12816" ±320.400	12816" ±320.400		
12960" ±324.000	12960" ±324.000		
13104" ±327.600	13104" ±327.600		
13248" ±331.200	13248" ±331.200		
13392" ±334.800	13392" ±334.800		
13536" ±338.400	13536" ±338.400		
13680" ±342.000	13680" ±342.000		
13824" ±345.600	13824" ±345.600		
13968" ±349.200	13968" ±349.200		
14112" ±352.800	14112" ±352.800		
14256" ±356.400	14256" ±356.400		
14400" ±360.000	14400" ±360.000		
14544" ±363.600	14544" ±363.600		
14688" ±367.200	14688" ±367.200		
14832" ±370.800	14832" ±370.800		
14976" ±374.400	14976" ±374.400		
15120" ±378.000	15120" ±378.000		
15264" ±381.600	15264" ±381.600		
15408" ±385.200	15408" ±385.200		
15552" ±388.800	15552" ±388.800		
15696" ±392.400	15696" ±392.400		
15840" ±396.000	15840" ±396.000		
15984" ±399.600	15984" ±399.600		
16128" ±403.200	16128" ±403.200		
16272" ±406.800	16272" ±406.800		
16416" ±410.400	16416" ±410.400		
16560" ±414.000	16560" ±414.000		
16704" ±417.600	16704" ±417.600		
16848" ±421.20			

INLET ELBOWS

MECHANICAL JOINT ELBOW

SIZE	A	B	C	J	HOLES	
					NO.	SIZE
4	8.35	2.45	4.91	7.50	4	3/4
6	8.35	2.58	7.13	9.50	6	3/4

PLAIN END WITH INTEGRAL GLAND ELBOW

SIZE	A	B	C	J	HOLES	
					NO.	SIZE
4	8.35	3.15	4.54	7.50	4	3/4
6	8.35	3.25	6.75	9.50	6	3/4

FLANGED JOINT ELBOW

SIZE	A	B	C	J	HOLES	
					NO.	SIZE
4	8.25	0.91	9.00	7.50	8	3/4
6	8.25	0.97	11.00	9.50	8	7/8

TYTON JOINT ELBOW

SIZE	A	B	C	J	K	L
6	10.00	3.59	7.05	12.03	1.23	7/8

WEIGHT CHART

BURY DEPTH	1' 6"	2' 0"	2' 6"	3' 0"	3' 6"	4' 0"	4' 6"	5' 0"	5' 6"	6' 0"	6' 6"
WEIGHT (lbs.)	352	368	385	402	419	435	452	469	486	502	519
BURY DEPTH	7' 0"	7' 6"	8' 0"	8' 6"	9' 0"	9' 6"	10' 0"	10' 6"	11' 0"	11' 6"	12' 0"
WEIGHT (lbs.)	536	553	570	586	603	620	637	653	670	687	704

INSTALLATION

1. 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.

2. 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.

3. 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.

4. 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.

5. 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.

6. 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.

7. 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.

8. 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.

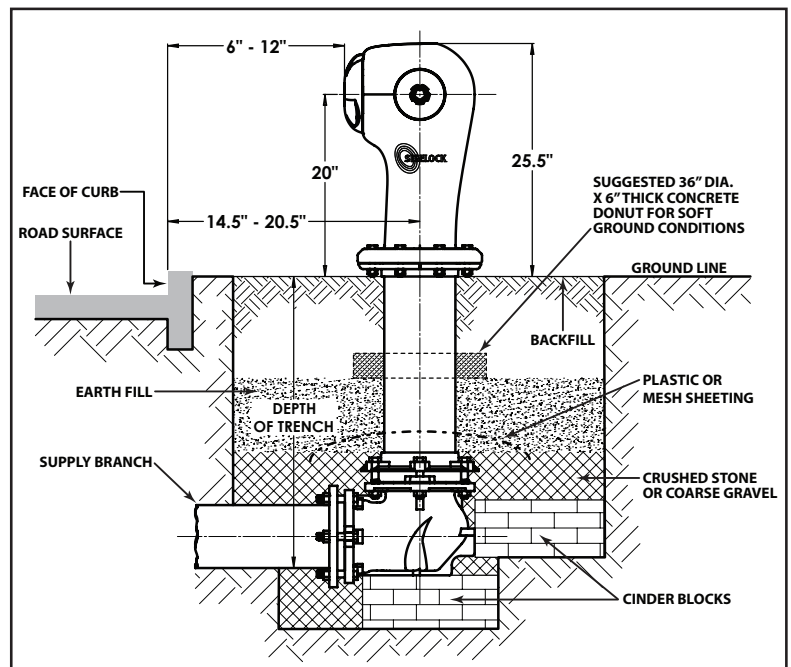
9. Restrain hydrant movement with appropriate thrust blocking or restrained joint to prevent pipe joint separation.

10. When first installed, the hydrant should be operated from full closed to full open position and back to make sure no obstructions are present.

11. 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 valves. Therefore, the main valve 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 *Opening Tool* and *All-in-One Wrench*. Using the *All-in-One Wrench*, turn the *operating nut* until the valve 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 valve 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 *Opening Tool* and *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 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 valve* 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 and disengage *Opening Tool*.

REPLACING SAFETY FLANGES AND SAFETY COUPLING

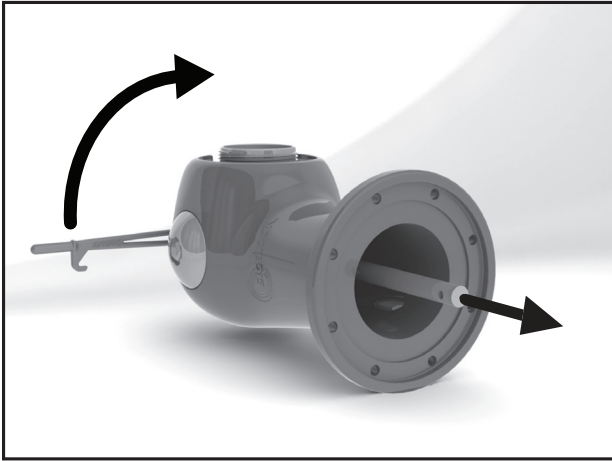
Should a hydrant be struck by a vehicle such that the *nozzle section housing* is severed from the *standpipe*, the following procedure should be followed to reassemble the hydrant and make it operational. (A traffic damage repair kit for the specific hydrant is required to perform this procedure.)

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 valve stem* by removing the *self locking cotter pins* and verify that the *upper valve 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 *Opening Tool* and *All-In-One Wrench* to remove the *pumper cap* from *nozzle section housing*.

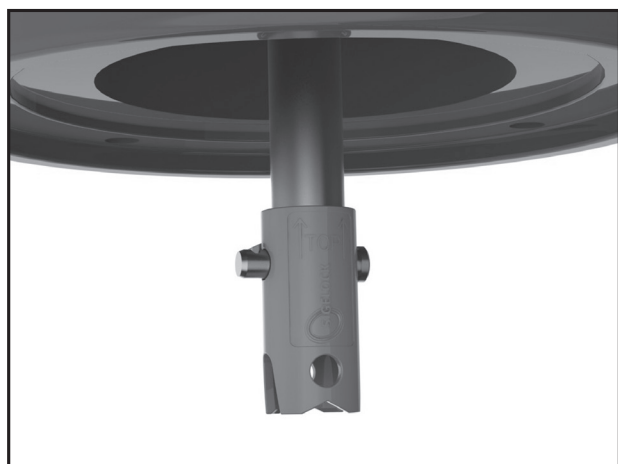
(Note: It is recommended that the hydrant be firmly secured before attempting to remove the *pumper cap* while the hydrant is on the ground.)

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



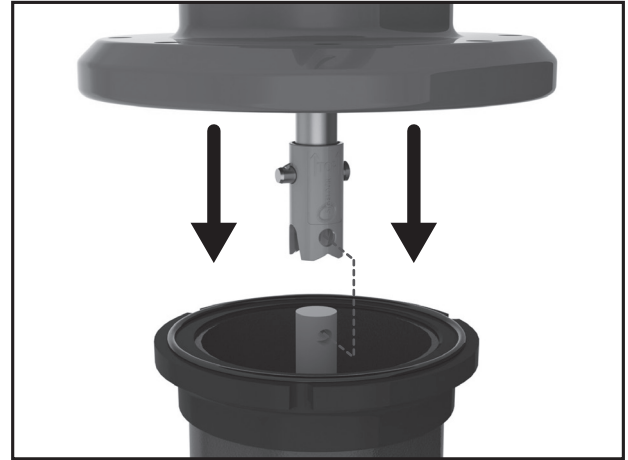
8. Remove the *self locking cotter pin* from the *lower valve stem* and verify that the stem end will receive the new *safety coupling*. (Note: Discard old *self locking cotter pin*.) (Note: If the *lower valve stem* will not receive a new *safety coupling*, the *main valve assembly* must be removed and the *lower valve stem* will need to be replaced, see **Removing Main Valve 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 valve stem* such that the hole in the *safety coupling* aligns with the hole on the *upper valve stem*. Lock the *safety coupling* in place with new stainless steel *self locking cotter pin*.



10. Place a new *standpipe o-ring* on the *standpipe* section. (Note: discard old *standpipe o-ring*.)

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 valve stem* with the *lower valve stem* such that the bottom hole in the coupling aligns with the top hole on the *lower valve stem*.

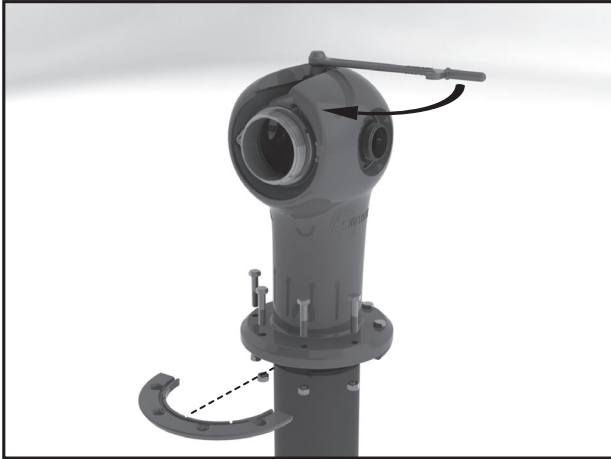


12. Slide the *safety coupling* over the *lower valve stem* and insert new stainless steel *self locking cotter pin*. (Note: Once the *safety coupling* is lowered near the *lower valve stem*, it is easiest to do any incremental adjustments by turning the *operating nut* respectively.)

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 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*.

REMOVING MAIN VALVE FROM STANDPIPE

1. Shut off water at the auxillary or secondary valve.

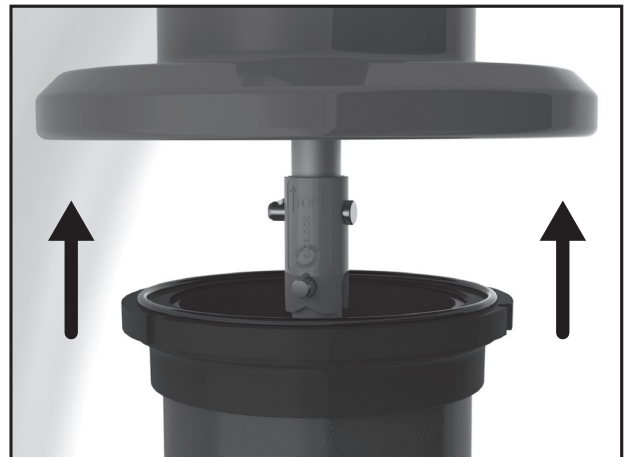
2. Remove the *pumper cap* using the *Opening Tool* and *All-In-One Wrench*. Once the *pumper cap* has been removed, remove the *hose caps* using the *All-In-One Wrench*.

3. Open the valve until it bottoms out by turning the *operating nut* in the OPEN direction.

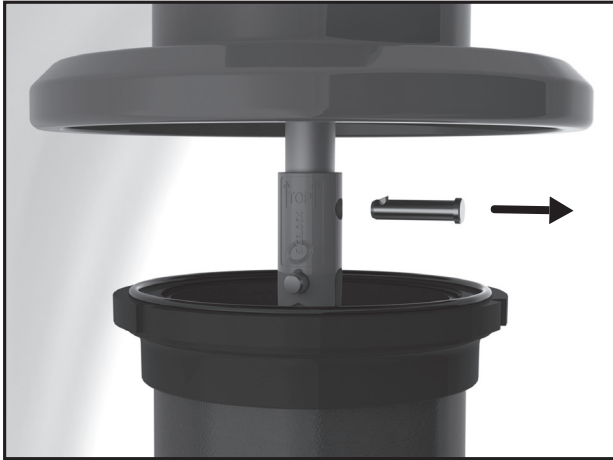


4. Remove *safety flange bolts* and *safety flanges*.

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



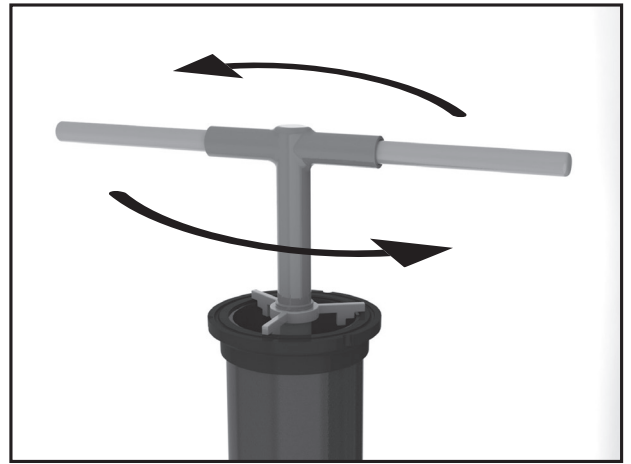
7. Completely remove *nozzle section housing* assembly from *standpipe*. (Note: When setting the hydrant, it is first recommended to turn the *upper valve stem* by hand in the closing direction in order to raise the stem so that the hydrant will not tip over when it is set on the ground.)



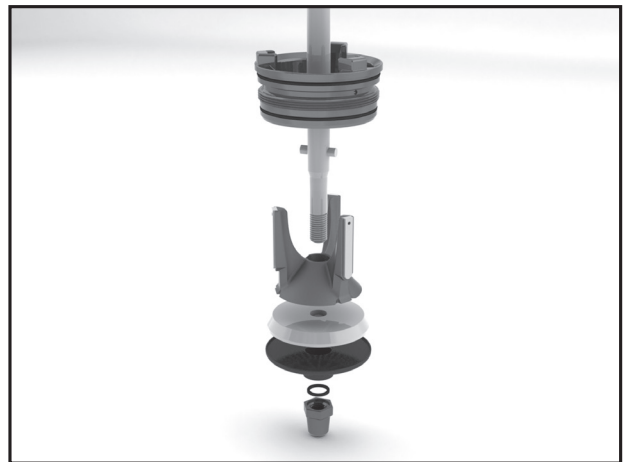
8. Remove *standpipe o-ring* from *standpipe*. Remove *self locking cotter pin* from the *lower valve stem* and remove *safety coupling*.

9. Slide the slotted end of *Seat Wrench* over the *lower valve stem*. Align slots in wrench so that the *grooved pin* in the *lower valve stem* will slide through the slots. Place the guides of the *Seat Wrench* into the top of the *standpipe* for stability.

10. Remove *main valve* assembly by turning the *Seat Wrench* anti-clockwise to unthread the *valve seat ring*. Lift out *Seat Wrench*, *lower valve stem*, *main valve* assembly and *valve seat ring* from hydrant *standpipe*.



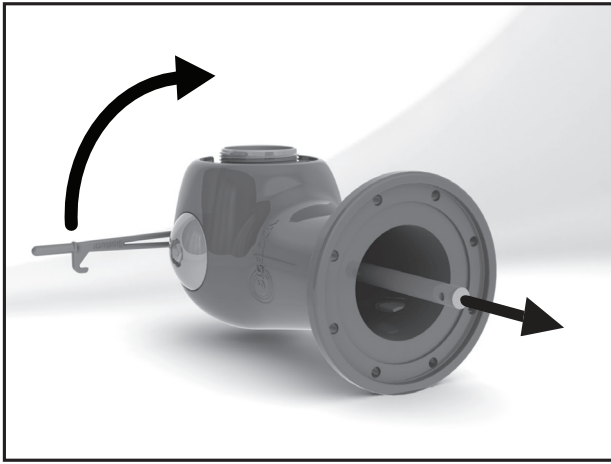
11. To disassemble *lower valve* assembly, unscrew *bottom plate nut* and remove *bottom plate nut o-ring*, *lower valve plate*, *main valve*, *valve seat ring* and *tri-arm valve top plate*. Clean, inspect and replace any damaged parts. Inspect and lubricate *top* and *bottom valve seat ring o-rings*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



12. Lower *main valve* Assembly and carefully thread *valve seat ring* into the *drain ring* at the base of the hydrant hand-tight. Raise the *main valve* assembly leaving about 1/2" of play between the *main valve* and seat. Lower *Seat Wrench* over the *lower valve stem*. Place the guides of the *Seat Wrench* into the top of the *standpipe* for stability.

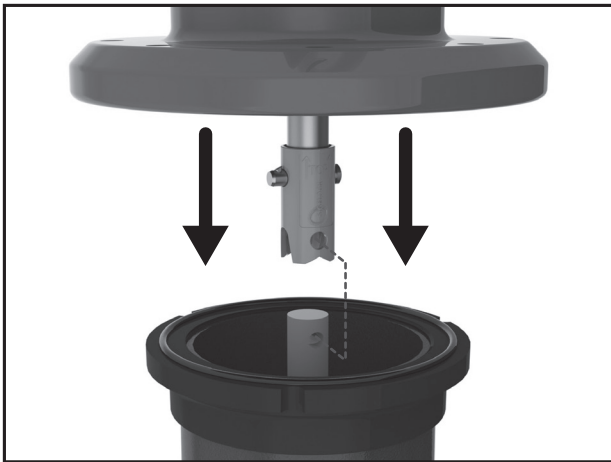
13. Tighten *main valve* to 200 ft-lbs. Remove *Seat Wrench*.

14. Turn the *operating nut*, while holding the *upper valve stem* until the stem lowers a few inches, about 4", below the hydrant flange; this will extend the *upper valve stem* and ease the alignment of the *safety coupling* with the *lower valve stem*.



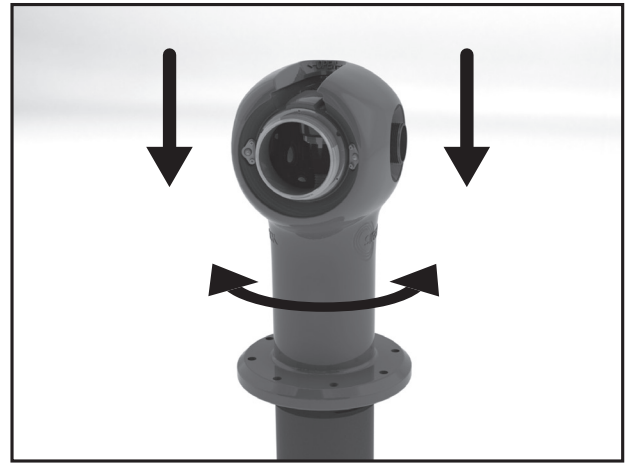
15. Re-attach the *safety coupling* onto the *lower valve stem* and align it with the *lower valve stem* such that the bottom hole in the coupling aligns with the top hole on the *lower valve stem*.

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 valve stem* into the *safety coupling* and insert stainless steel *self locking cotter pin*. (Note: Once the *lower valve 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.

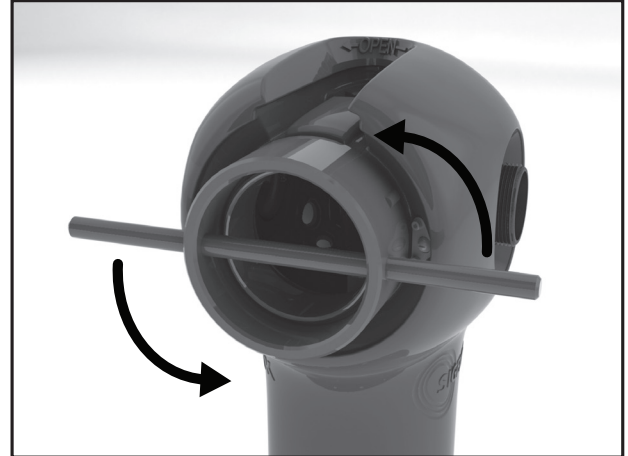
22. After operation testing is completed, turn *operating nut* in closing direction to make sure *main valve* is closed tightly, then turn in opening direction approximately ¼ turn to relieve tension on operating mechanism. Return all *pumper* and *hose caps*.

REPLACING NOZZLES

1. Remove *pumper nozzle cap* using the *Opening Tool* and *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 *Opening Tool* and *All-In-One Wrench*.
2. Tighten *operating nut* Using *All-In-One Wrench* to be sure *main valve* is in the fully closed position.
3. Remove all 6 *inlet flange bolt nuts*.
3. Slip off *inlet elbow*.

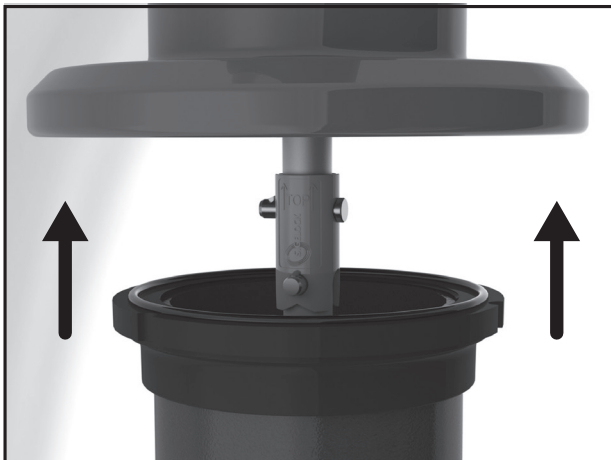
4. Lubricate new *inlet elbow* and *valve seat ring o-ring*.
5. Position *inlet elbow* to slip in place.
6. Slip new *inlet elbow* in place being careful not to damage *valve seat ring o-ring*.
7. Replace all 6 *inlet flange bolt nuts*. Tighten to approximately 125 - 165 ft-lbs.

INSERTING EXTENSION SECTION

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

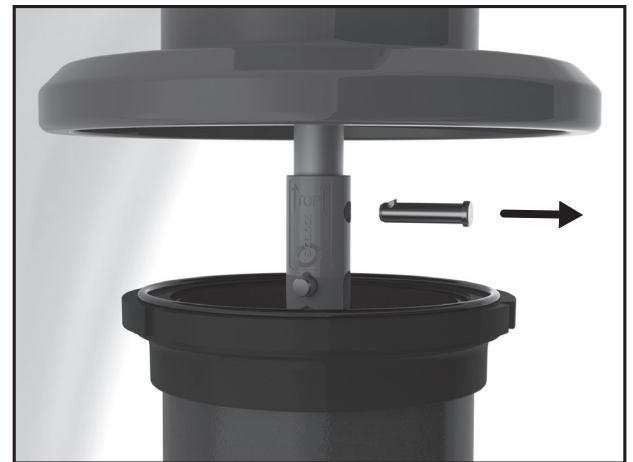


4. Remove *safety flange bolts* and *safety flanges*.
5. Lift *nozzle section housing*. (Note: It is recommended that the *nozzle section housing* assembly be lifted with the assistance of a stable boom arm capable of securely lifting 200 lbs. It will be necessary to remove both *hose caps* so that a 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 stem*. (Note: Make sure the *upper* and *lower valve stems* are not in tension when attempting to remove the cotter pin by turning the *operating nut* appropriately.)



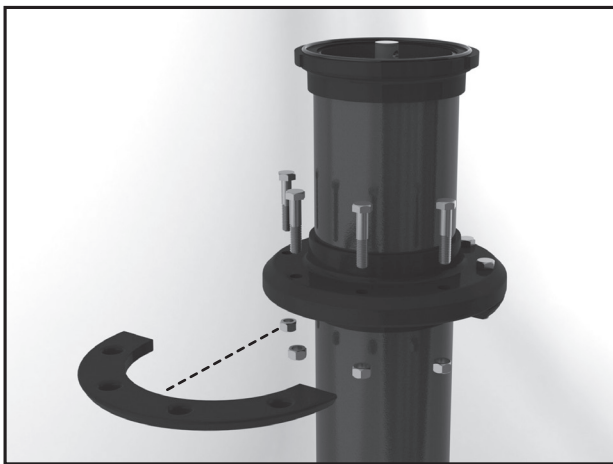
7. Completely remove *nozzle section housing* assembly from *standpipe*. (Note: When setting the hydrant, it is first recommended to turn the *upper valve stem* by hand in the closing direction in order to raise the stem so that the hydrant will not tip over when it is set on the ground.)



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

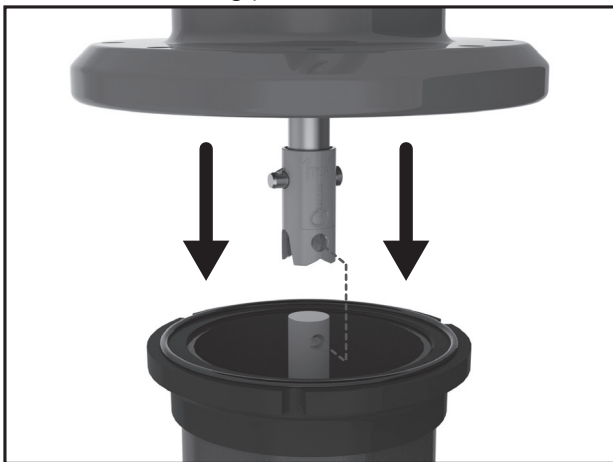


9. Attach *extension barrel* to *standpipe* with *solid flange* halves (without groove) and bolts. Place a *standpipe o-ring* on top of *extension barrel*.



10. Re-attach the *safety coupling* onto the *lower valve stem* and align it with the *lower valve stem* such that the bottom hole in the coupling aligns with the top hole on the *lower valve stem*.

11. Lift the *nozzle section housing* assembly and position it over the *extension barrel* 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*.)



12. Slide the *lower valve stem* into the *safety coupling* and insert stainless steel *self locking cotter pin*. (Note: Once the *lower valve 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 auxiliary 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 $\frac{1}{4}$ 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 valve pins* are properly installed.
2. Remove *pumper nozzle cap* and close hydrant. Check with listening device to determine if water is passing by main valve. If it is determined that the main valve 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 valve. Follow the seat removing instructions to replace the valve.

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 valve 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.

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 304 and 316 stainless steel.
5. Working pressure 250 p.s.i.g., test pressure 500 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 250 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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