

# OPERATION AND MAINTENANCE MANUAL

## 4-3/4" WATEROUS TREND FIRE HYDRANT



AMERICAN

FLOW CONTROL

**THE RIGHT WAY**



# INDEX

## 4-3/4" WATEROUS TREND FIRE HYDRANT

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## 4-3/4" WATEROUS TREND - OPERATION

### Operation

AMERICAN Flow Control recommends you follow the general Inspection and Installation guidelines outlined in AWWA Manual M17 for Installation, Field Testing, and Maintenance of Fire Hydrants and/or as recommended below. The thrust bearing hydrant requires a minimum of torque to operate. **WARNING: Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment. 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 nozzle section.
2. To open, turn the operating nut until the main valve is fully open and the travel stop nut limits further opening. **Do not force the hydrant in the opening direction beyond fully-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. Always open the hydrant completely, never only partially. A hydrant that is partially open will allow pressurized flow through the drain valve, which may wash away the soil from the area surrounding the base, or the partially open main valve may trap small stones or other debris between the valve seal and seat.
3. To close, turn the operating nut until the valve stops the flow. **It is not necessary to close this style of hydrant with great force.** Once the flow has stopped, turn the operating nut in the opening direction about 1/4 turn to take the strain off the operating parts of the hydrant. If the hydrant does not shut off completely, do not attempt to force the hydrant to close. Debris and small stones may be trapped in the valve seat and may be preventing the hydrant from closing. Partially open and close the hydrant several times to help dislodge the debris. If this does not work, safely remove the hydrant operating rod assembly, remove the debris and repair as detailed in subsequent sections of this manual.
4. **WARNING: FAILURE TO RELIEVE PRESSURE CAN RESULT IN THE CAP BLOWING OFF, CAUSING INJURY OR DEATH.** Make sure the auxiliary gate valve in the lateral between the main and the hydrant is closed and that the hydrant is not charged with pressure when removing caps.

## Routine Inspection



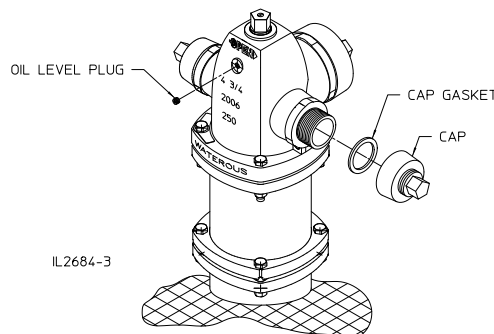
### Inspection

1. It is recommended that hydrants be inspected twice per year to ensure their satisfactory operation. After each use (especially in cold weather) hydrants should be specifically inspected for drainage.
2. Routine inspection should cover the points outlined in AWWA Manual M17 and include (but not be limited to) the following points:
  - a. External inspection of paint, caps, chains, etc.
  - b. Checking traffic type hydrants for damage to the breakaway feature.
  - c. Using a listening device to check the main valve for leakage.
  - d. Statically testing the hydrant to look for leakage at gaskets, caps, O-rings and drains.
  - e. Verifying the hydrant drains properly.
  - f. Cycling the hydrant from full open to full close.
  - g. Check for routine lubrication needs which includes but may not be limited to loss of lubricant, nozzle caps and operating mechanism.
3. At time of inspection, flush the hydrant to remove any foreign material from the hydrant and the lateral. If necessary, flush the drains by filling the hydrant and then cycling open the main valve two times to force water out of the drains under pressure. If the hydrant is non-draining type, pump water out after flushing.

### MAINTENANCE

**AMERICAN Flow Control strongly recommends that you follow routine maintenance on fire hydrants as outlined in AWWA Manual M17 for Installation, Field Testing, and Maintenance of Fire Hydrants. The ease of operation and the frequency of repair depends on the condition of the water system and the maintenance given. Dirt, gravel and other foreign material in the hydrant may prevent it from closing or draining properly, which may result in damage to the hydrant main valve. Under most operating conditions, AMERICAN Flow Control recommends semi-annual lubrication and inspection of fire hydrants.**

1. Twice per year, open the hydrant completely and flush for several minutes. Open and close valve to make sure it works properly, and check for leaks.
2. Remove a cap and verify that the hydrant is draining properly. After the main valve is closed, the water in the hydrant should drain rapidly. If it does not, the drain ports may be clogged. To clear drain ports, install nozzle cap, and tighten until water tight, then open hydrant two or three turns for several minutes. This will leave drain port partially open and permit water pressure to wash out the obstruction. If this method is unsuccessful, remove the operating rod assembly and clean the drain mechanism. If neither of above methods permits water to drain, it indicates that the drainage area around the hydrant base should be rebuilt.
3. **Oil Reservoir Hydrants:**  
Remove oil level plug and check oil level. The oil level should be to the level of the plug. If it is necessary to add oil, remove the oil level plug on the back of the nozzle section and add oil.
4. **Non-Oil Reservoir Hydrants:**  
Remove screw from operating nut, and add approximately one tablespoon of oil through opening. Replace screw.
5. Remove all nozzle caps, clean rust or corrosion from threads of nozzles and caps, and replace cap gaskets if necessary. Apply a light coat of grease to nozzle threads before replacing cap.



MODEL WB77-1

**Note: Where oil or grease is specified, use an AMERICAN Flow Control recommended food grade lubricant.**

## 4-3/4" WATEROUS TREND - TROUBLESHOOTING GUIDE



**WARNING:** Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. **FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment.

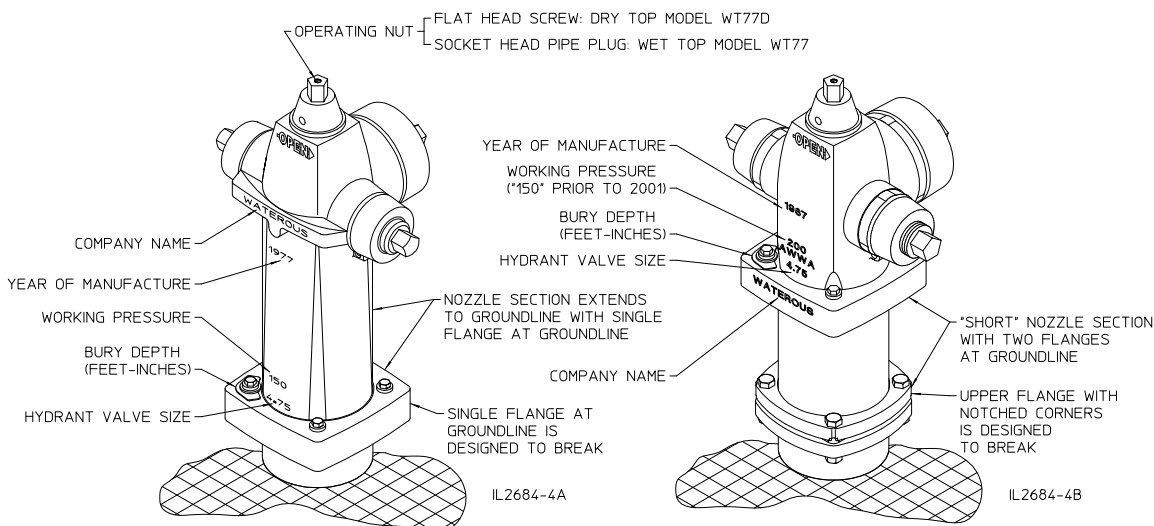
### Problem

### Solution

- |   |  |
|---|--|
| <ol style="list-style-type: none"><li>1. Operating nut turns freely but hydrant does not open.</li><li>2. Hydrant will not shut off or ground around hydrant is highly saturated.</li><li>3. External leakage is noticed around the operating nut.</li><li>4. Operating nut is extremely hard to turn.</li><li>5. Water is dripping around nozzles.</li><li>6. Hydrant will not drain properly.</li></ol> | <ol style="list-style-type: none"><li>1. Inspect rod coupling for breakage and ensure rod pin is properly installed.</li><li>2. Close hydrant and remove nozzle cap. 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:<ol style="list-style-type: none"><li>a. Flush hydrant in fully open position (watch to see if rocks or other foreign objects flush out of the barrel).</li><li>b. After flushing for several minutes, shut off the hydrant. Watch for several minutes to see if flow stops. Place hand over open hose nozzle; suction should be felt, indicating hydrant is no longer leaking and drains are working properly.</li><li>c. If flushing does not solve the problem, it would indicate that something is trapped or has cut the main valve rubber. Follow the seat removing instructions to replace the valve. Check threads on bronze seat to be sure that is not damaged. If threads appear worn or bent, replace the bronze seat.</li><li>d. 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.</li></ol></li><li>3. This indicates that O-rings are cut or missing. Replace o-rings as referenced in the disassembly and repair instructions.</li><li>4. Try to turn the operating nut. If the nut turns, carefully turn the nut back from a tight closed position until it turns freely. If it is necessary to add lubricant, for hydrants with an oil reservoir, remove the oil level plug on the back of the nozzle section and add oil. Fill oil to the level of the plug, if necessary. For hydrants with no oil reservoir, remove the flat head screw on the operating nut and add mineral oil or similar lubricant. <b>ALWAYS FULLY OPEN AND CLOSE THE HYDRANT AFTER LUBRICATING.</b> Replace the oil level plug or the flat head screw taking care to replace the thread sealant. The hydrant should cycle freely. If this does not solve the problem, remove the operating nut. Inspect the threads of the operating nut and upper rod. Inspect the thrust washer to ensure it is lubricated and is undamaged. Replace and/or lubricate the thrust washer if necessary. If this does not solve the problem, remove the hydrant seat and flush thoroughly. Note: <b>Where grease is specified, use an AMERICAN Flow Control recommended food grade grease</b></li><li>5. Close hydrant and remove nozzle cap. Replace cap gasket. Check the nozzle to be sure it is properly installed. Earlier model hydrants used caulked nozzles. Nozzle may require re-caulking or replacement of barrel. If nozzle has an O-ring behind the nozzle, it may need replacing.</li><li>6. Check to be sure the water table has not risen too high to allow for drainage. Flush hydrant to be sure drains are clear. Open hydrant slowly several turns while leaving caps firmly in place to ensure hydrant drains are clear. Close hydrant and repeat this procedure. Do this slowly several times. If this does not solve the problem, remove the hydrant seat assembly and check the rubber drain facings. If no problems are found, excavate the hydrant to see if concrete or other materials have blocked the drain outlets.</li></ol> |
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## 4-3/4" WATEROUS TREND – IDENTIFYING VARIATIONS / REPAIR KITS

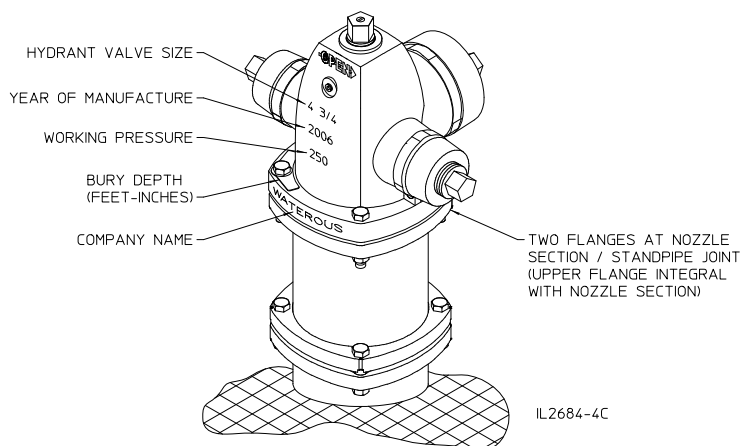


DRY TOP MODEL WT77D: BUILT FROM 1977 TO 1996  
WET TOP MODEL WT77: BUILT FROM 1977 TO 1987

(SEE NOTE 6)

MODEL WB77: BUILT FROM 1987 TO 2006

(SEE NOTE 6)



MODEL WB77-1: BUILT FROM 2006 TO PRESENT

4-3/4" TREND HYDRANT  
AVAILABLE IN TRAFFIC CONFIGURATION ONLY

## Repair Parts

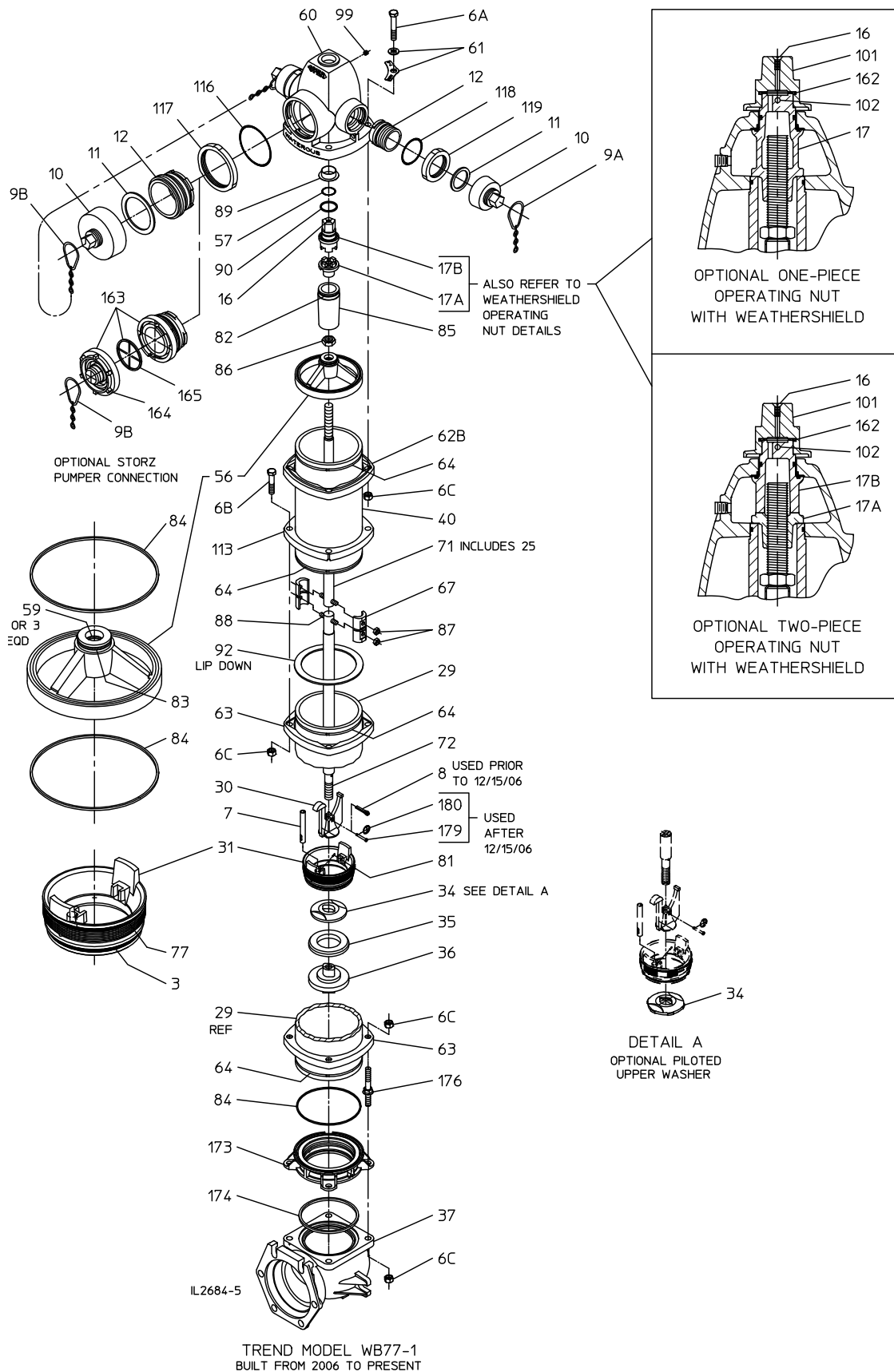
To assure prompt delivery and shipment of the correct parts, furnish the following information with each repair parts order.

1. Date of manufacture or purchase of hydrant.
2. Depth of bury.  
**NOTE: Depth is shown on bury depth plate.**
3. Hydrant opening direction.
4. Check original order to see if any special parts are required.  
For replacement nozzles, caps, and operating nuts, be sure to furnish thread data and size and shape of nut.
5. For each part ordered, give reference number and description as found on the following parts lists.

**NOTE: Kits are available for making most repairs or extending the hydrant.**

6. For more information on repairs to a Trend Model WB77 built prior to mid 2006, see the following instructions:
  - 351, Installation, Operation, Maintenance and Overhaul Instructions.
  - H-358, Trend Traffic Damage Repair
  - H-404, Installation Instructions for Standpipe and Rod Extension Kit K479 in Trend Fire Hydrants.

# Parts List - 250 PSIG Rated Ductile Iron 4-3/4" Waterous Trend





## Parts List - 250 PSIG Rated Ductile Iron 4-3/4" Waterous Trend

### Traffic Model WB77-1

REF NO.	DESCRIPTION	MATERIAL
3	O-ring (Lower valve seat), 5-5/8 x 6-3/64	Buna-N
6A	Hex hd bolt, 5/8-11 x 3-3/4 in.	Plated steel
6B	Hex hd bolt, 5/8-11 x 3 in.	Plated steel
6C	Hex nut, 5/8-11 (Above grade)	Plated steel
6C	Hex nut, 5/8-11 (Below grade)	Stainless steel
7	Drain plunger	Red brass
8	Cotter pin, 1/4 x 1-1/2 in.	Stainless steel
9A, 9B	Nozzle cap chain, single or double	Plated steel
10	Nozzle cap, hose or pumper	Ductile iron
11	Cap gasket, hose or pumper	Neoprene
12	Nozzle, hose or pumper	Brass
16	Flat hd screw, 1/4-20 x 1/2 in.	Stainless steel
17	Operating nut (one-piece)	Bronze
17A	Lower operating nut	Bronze
17B	Upper operating nut	Ductile iron**
25	Rod bushing	Red brass
29	Lower standpipe	Centrifugally cast ductile iron pipe*
30	Crossarm	Bronze
31	Valve seat	Bronze
34	Upper valve washer	Gray iron
35	Main valve rubber	Urethane
36	Lower valve washer	Gray iron
37	Hydrant bottom	Ductile iron
40	Upper standpipe	Centrifugally cast ductile iron pipe*
56	Support wheel	Ductile iron
57	O-ring (Operating nut), 1-1/2 x 1-3/4	Buna-N
59	O-ring (Support wheel), 1-1/8 x 1-3/8	Buna-N
60	Nozzle section	Ductile iron
61	Bury depth plate	Aluminum
61	Bury depth plate washer	Plated steel
62B	Upper standpipe flange	Ductile iron
63	Standpipe flange	Ductile iron
64	Flange lock ring	Stainless steel
67	Coupling sleeve (two-halves)	Gray iron
71	Upper rod	Steel rod
72	Lower rod	Steel rod
77	O-ring (Upper valve seat), 5-7/8 x 6-1/4	Buna-N
81	Groove pin, 3/32 x 7/16 in.	Beryllium copper
82	O-ring (Upper tube seal), 2-3/8 x 2-5/8	Buna-N
83	O-ring (Lower tube seal), 1-7/8 x 2-1/8	Buna-N
84	Support wheel / Lower standpipe gasket	Buna-N
85	Support tube	Ductile iron
86	Stop nut, 1"- 8	Plated steel
87	Coupling nut, 1/2-20	Brass
88	Coupling stud, 1/2-20 x 2-9/16 in.	Stainless steel
89	Nozzle section bushing	Brass
90	Thrust ring	Polymer bearing
92	Upper standpipe gasket	Neoprene
99	Pipe plug, 1/4 NPT	Brass
101	Weathershield nut	Ductile iron
102	Spirol pin, hvy, 1/4 x 2-1/4 in.	Stainless steel
113	Breakable flange	Ductile iron
116	O-ring (Pumper nozzle), 5-1/4 x 5-3/4	Buna-N
117	Pumper nozzle retainer	Ductile iron
118	O-ring (Hose nozzle), 3-1/4 x 3-5/8	Buna-N
119	Hose nozzle retainer	Ductile iron
162	Weathershield nut gasket	Nitrile
163	Nozzle, pumper, Storz (with cap and gasket)	Bronze and Aluminum
164	Nozzle cap, pumper, Storz	Aluminum
165	Cap gasket, pumper, Storz	Buna-N
173	Valve seat insert	Bronze
174	Valve seat insert gasket	Nitrile
176	Stud, 5/8-11 x 5.650 in.	Stainless steel
179	Clevis pin, 1/4 x 1-11/16 in.	Stainless steel
180	Kickout ring	Stainless steel

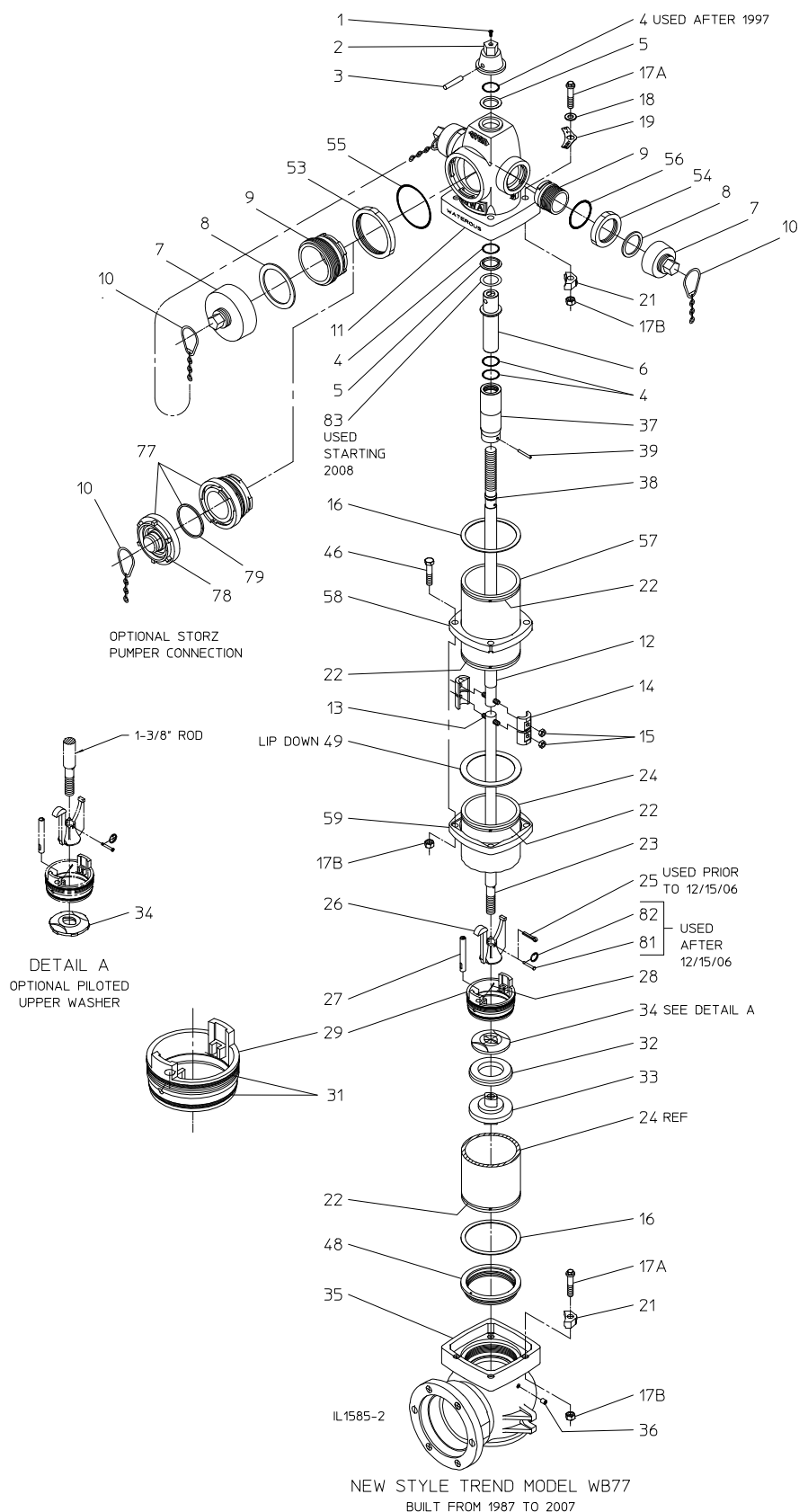
\*AWWA Standard C151 (ANSI A21.51)

\*\*Bronze is optional on some nut sizes





## Parts List - 200 PSIG Rated Gray Iron 4-3/4" Waterous Trend





## Parts List - 200 PSIG Rated Gray Iron 4-3/4" Waterous Trend Traffic Model WB77

REF NO.	DESCRIPTION	MATERIAL
*1	Flat hd screw, 1/4-20 x 1/2 in.	Stainless steel
2	Weathershield nut	Gray iron
3	Spirol pin, hvy, 1/2 x 2-3/4 in.	Stainless steel
4	O-ring, 1-3/4 x 2	Buna-N
5	Thrust bushing	Sintered bronze
6	Operating nut	Brass
*7	Nozzle cap, hose or pumper	Ductile iron
*8	Cap gasket, hose or pumper	Neoprene
*9	Nozzle, hose or pumper	Bronze
*10	Nozzle cap chain, single or double	Plated steel
11	Nozzle section	Gray iron
12	Upper rod	Steel rod
*13	Coupling stud, 1/2-20 x 2-9/16 in.	Stainless steel
*14	Coupling sleeve (two halves)	Gray iron
*15	Coupling nut, 1/2-20	Brass
16	Standpipe gasket	Neoprene
*17A	Hex hd bolt, 5/8-11 x 3 in.	Plated steel
*17B	Hex nut, 5/8-11	Plated steel
*18	Bury depth plate washer	Plated steel
*19	Bury depth plate	Aluminum
*21	Lock ring clamp	Malleable iron
22	Flange lock ring	Stainless steel
*23	Lower rod	Steel rod
24	Lower standpipe	Centrifugally cast ductile iron pipe
*25	Cotter pin, 1/4 x 1-1/2 in.	Stainless Steel
26	Crossarm	Ductile iron
*27	Drain plunger	Red brass
*28	Groove pin, 3/32 x 7/16 in.	Beryllium copper
29	Valve seat	Bronze
31	O-ring, 4-7/8 x 5-1/4	Buna-N
32	Main valve rubber	Urethane
33	Lower valve washer	Gray iron
34	Upper valve washer	Gray iron
35	Hydrant bottom	Gray iron
*36	Drain bushing	Brass
37	Operating nut housing	Gray iron
38	O-ring, 1" x 1-1/4	Buna-N
39	Spirol pin, hvy, 1/4 x 2-1/4 in.	Stainless steel
*46	Hex hd bolt, 5/8-11 x 3 in.	Plated steel
48	Valve seat insert	Silicone brass
49	Upper standpipe gasket	Neoprene
*53	Pumper nozzle retainer	Ductile iron
*54	Hose nozzle retainer	Ductile iron
*55	O-ring (pumper nozzle), 5-1/4 x 5-3/4	Buna-N
*56	O-ring (hose nozzle), 3-1/4 x 3-5/8	Buna-N
57	Upper standpipe	Centrifugally cast ductile iron pipe
58	Breakable flange	Gray iron
59	Standpipe flange	Ductile iron
77	Nozzle, pumper, Storz (with cap and gasket)	Bronze and Aluminum
78	Nozzle cap, pumper, Storz	Aluminum
79	Cap gasket, pumper, Storz	Buna-N
81	Clevis pin, 1/4 x 1-11/16 in.	Stainless Steel
82	Kickout ring	Stainless Steel
83	Thrust washer (used starting 2008)	Teflon

\*These parts are interchangeable with Waterous Pacer parts.



### Disassembling the Hydrant

**WARNING:** Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. **FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment.

1. **Shut off water line leading to hydrant making sure the hydrant is not under pressure. FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** Partially open hydrant valve to relieve trapped pressure. Standing to the side of the hydrant and away from the direction of the hydrant cap(s), loosen one of the hose caps to relieve any pressure that may be present in the hydrant barrel.
2. **See Figure 1, Page 2A-22**  
At the nozzle section, remove bolts (6A), nuts (6C), and allow flange (62B) to slide down the upper standpipe. Depth plate and washer (61) will come off with bolts.
3. Turn upper operating nut (17B) or weathershield nut (101) in the opening direction to separate the nozzle section (60) and the support (56). Remove the nozzle section. **Caution: use proper lifting and handling techniques to avoid injury.**
4. Remove operating nut (17B or 17) from the nozzle section (60). (On hydrants with weathershield, it is necessary to drive out pin (102) and remove weathershield (101) before upper operating nut can be removed.)
5. Unscrew lower operating nut (17A - two-piece nuts, 17 - one-piece nut), and remove support tube (85).
6. Unscrew hex stop nut (86) from operating rod (71), and remove support (56).
7. Carefully lower disassembly wrench into standpipe over operating rod, and engage lugs of valve seat (31). See Figure on Page 2A-22
8. Insert a three or four foot heavy steel bar (approximately 1 in. diameter) through eye of wrench, and turn in a counterclockwise direction to remove complete operating rod and valve assembly.
9. When valve seat (31) is clear of threads in hydrant bottom (37), remove disassembly wrench and lift out operating rod assembly.  
**See Figure 3, Page 2A-23**
10. To disassemble lower portion of operating rod, remove cotter pin (8) or clevis pin (179) and knockout ring (180). Hold rod (72) with a pipe wrench or in a vise, and unscrew lower washer (36) with a 1-9/16 end wrench or suitable adjustable wrench. (Main valve (35), upper washer (34), valve seat (31), and cross arm (30) will come off with lower washer.) Slide drain plunger (7) from valve seat. Remove O-rings (3 and 77). Do not remove groove pin (81), which guides drain plunger, unless it is damaged.
11. Disassemble breakable coupling, unscrew nuts (87), and remove rod coupling halves (67) which join upper rod (71) to lower rod (72). Do not remove studs (88) unless they are damaged. (Breakable coupling disassembly is usually not necessary unless coupling parts are damaged.)

**NOTE:** When a supply of gaskets and O-rings are available, always install new ones when reassembling the hydrant. Clean dirt from O-ring grooves.

Do not drop disassembly wrench into hydrant; it may damage valve seat and related parts.



## Reassembling the Hydrant

**WARNING:** Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. **FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment.

**Note:** Where grease is specified, use an AMERICAN Flow Control recommended food grade grease

### See Figure 1, Page 2A-22

1. Assemble breakable coupling. Slide rod coupling halves (67) onto the studs (88) in the upper and lower rods (71, 72) and install coupling nuts (87).
2. If necessary, install new groove pin (81) in valve seat (31). Slide drain plunger (7) into seat with oblong hole at lower end. Grease O-ring grooves in valve seat and install O-rings (3 and 77). Be sure to remove any twists.
3. Slide crossarm (30) and valve seat (31) on operating rod (72). Position main valve (35) and upper washer (34) on lower washer (36). Screw lower washer onto rod, engaging diamond boss on lower washer in matching recess in crossarm. Position valve seal against valve seat (35) and tighten lower washer to at least 65 ft-lbs. Tighten enough to permit installation of the clevis pin (179) and kickout ring (180).
4. Coat threads of valve seat (31) with grease. Carefully lower assembled operating rod into standpipe until valve seat rests on threads in valve seat insert. Grasping rod (71) firmly with both hands, slowly turn in a counterclockwise direction until threads engage, then turn clockwise until it is hand-tight.
5. Slowly lower disassembly wrench over operating rod (71) in standpipe, and engage it with valve seat (31). See Figure 2 on Page 2A-23. Insert a 3 or 4 foot heavy steel bar through eye of wrench and tighten valve seat securely in valve seat insert. Remove wrench.  
Do not exceed 200 ft-lbs torque (50 lb pull on the end of a 4 ft bar). One person using a bar 3 to 4 feet long can easily exert enough force to tighten valve seat. Further tightening may make future seat removal more difficult.
6. Pull rod up as far as it will go (main valve will now be closed. Hold in this position while an assistant slowly turns on the water.

**WARNING:** To prevent serious personal injury, do not stand over rod when assistant turns on the water.

7. Visually check for possible leaks before proceeding with the next step.

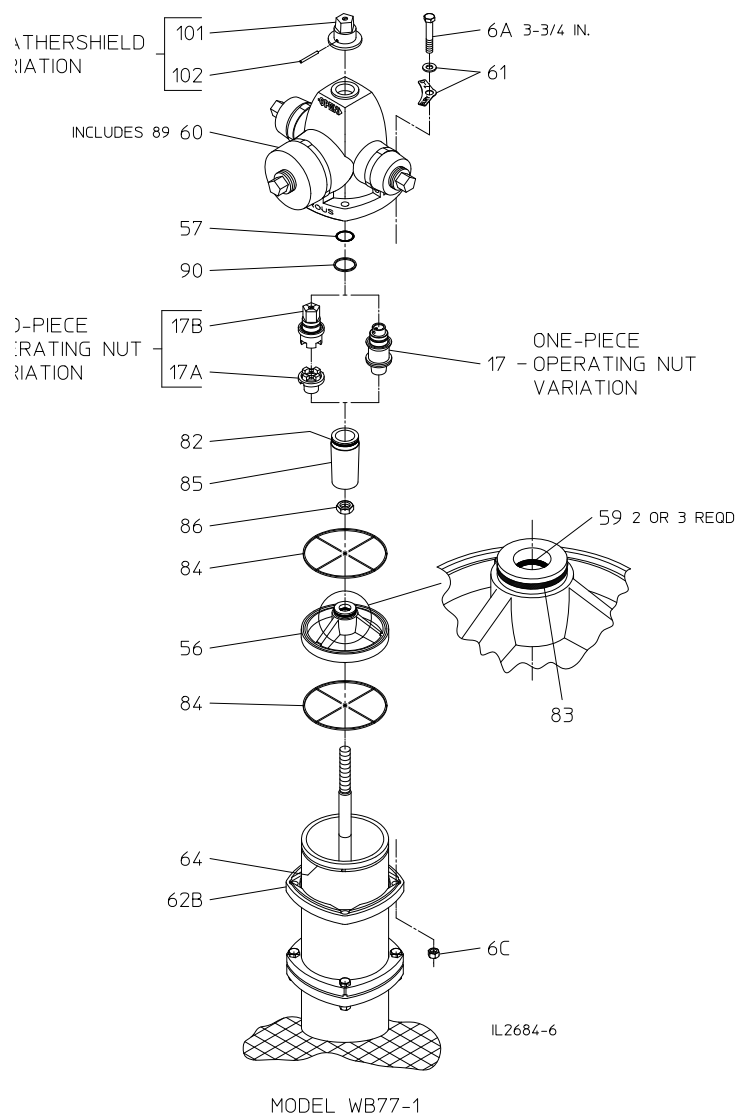
### See Figure 3, Page 2A-23

8. Grease O-ring and gasket grooves in support (56), and install O-rings (59), gaskets (84) and lower tube seal (83). Tape threads of operating rod (71) to protect O-rings, and install support. Remove tape from threads.
9. Install hex stop nut (86), turning it down to end of thread. Snug up with a torque of 30 ft-lbs (30 lb at end of 12 in. wrench).
10. Grease groove in upper end of support tube (85), and install upper tube seal (82). Slide tube down over operating rod (71) until it is seated on support (56).
11. Grease threads of operating rod (71) and lower bearing surface of operating nut (17A or 17). Screw lower operating nut onto rod while centering support (56) on the standpipe. Tighten operating nut (17A or 17) to securely clamp support (56) against upper standpipe (40). Be sure support (56) is centered on upper standpipe (40).
12. Grease and install thrust ring (90) and O-ring (57) in operating nut (17B or 17). If hydrant has a two-piece operating nut, set upper operating nut (17B) on lower operating nut (17A) and engage lugs in slots.
13. Carefully lower nozzle section (60) over operating nut (17b or 17) until it seats on support (56). Rotate nozzle section (60) to desired position. Install bolts (6A) and nuts (6C) through flange of nozzle section and standpipe flange (62B) and tighten finger tight. Be sure to install depth plate and washers (61) in proper position. Make sure flange (62B) is seated properly up under flange, and tighten all bolts and nuts evenly. Tighten to 60-70 ft-lbs of torque.
14. Back off operating nut slightly to release tension on operating rod. Since water pressure will hold valve up against seat, it is not necessary to turn operating nut to a dead stop if the valve and seat are in good condition.
15. Lubricate hydrant per "Lubrication" portion of the "Maintenance" section.

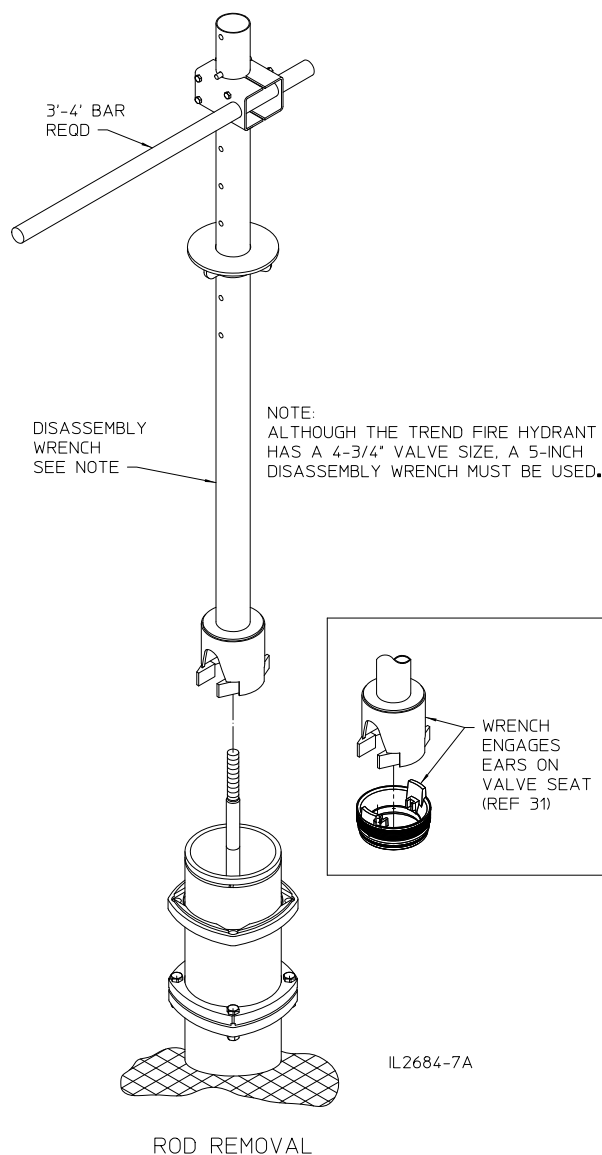


## 4-3/4" Waterous Trend Model WB77-1 - Repair Instructions

**Figure 1. Repair Diagram**



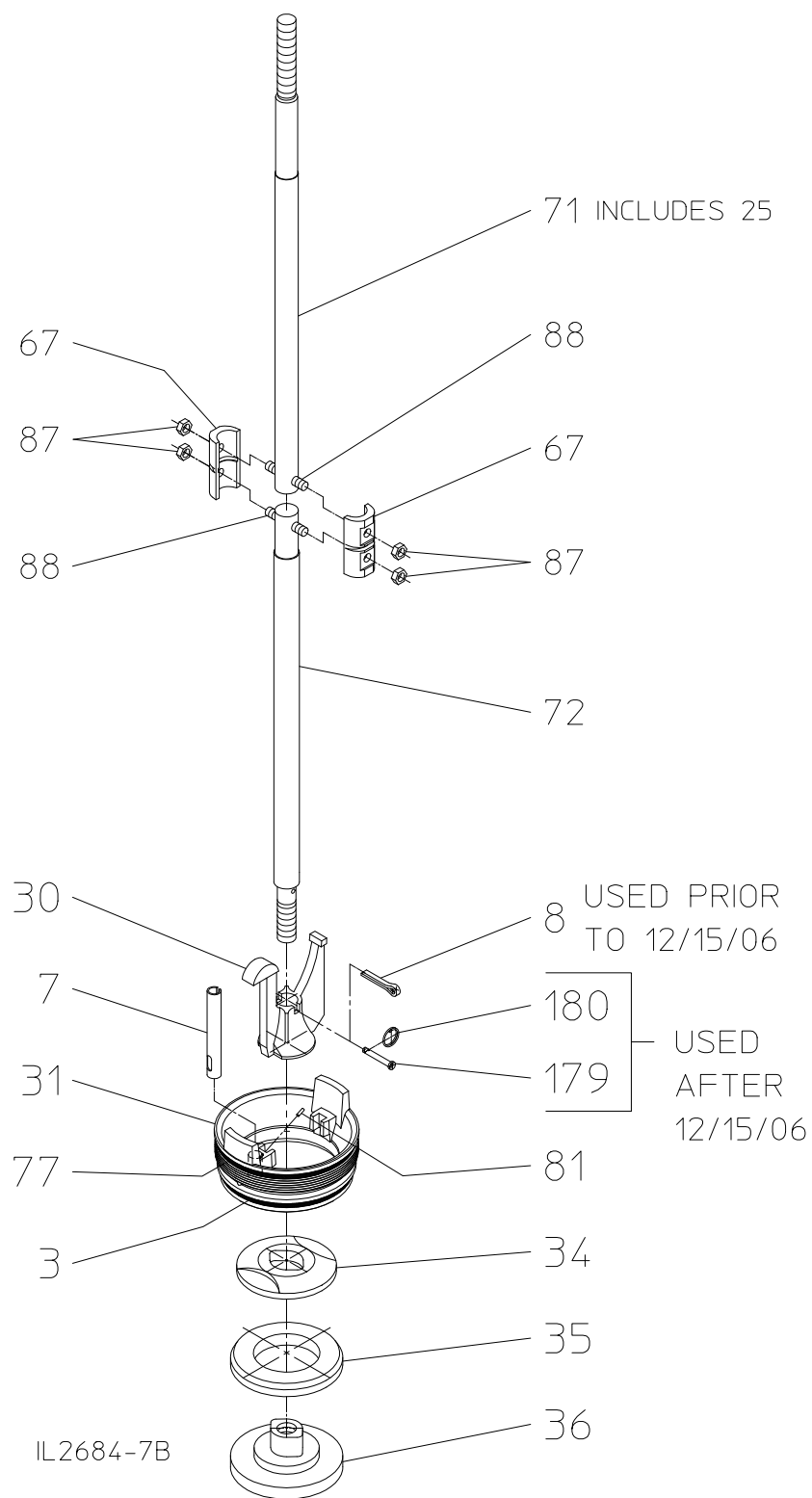
**Figure 2. Rod Removal**





## 4-3/4" Waterous Trend Model WB77-1 - Repair Instructions

Figure 3. Rod Disassembly



### ROD DISASSEMBLY



## 4-3/4" Waterous Trend Model WB77-1 - Traffic Damage Repair



**WARNING:** Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. **FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment.

### See Figure 1, Page 2A-25

Should a hydrant be struck by a vehicle such that the upper barrel is separated / broken from the lower barrel, 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.) The extent of a traffic impact may be unknown. It is considered safe practice to close the auxiliary valve ahead of the hydrant, or use another means to cut off flow and pressure to the hydrant.

**Note:** Where grease is specified, use an **AMERICAN Flow Control** recommended food grade grease.

1. At the groundline, remove bolts (6B) and nuts (6C) which attach the upper and lower flanges. Discard the gasket, nuts and bolts.

**Note:** If top of the hydrant is completely broken away from the lower portion of the hydrant, step 1 may not be necessary.

2. At the nozzle section, remove bolts (6A), nuts (6C) and allow flange (62B) to slide down the upper standpipe. Depth plate and plain washer (61) will come off with bolts.
3. Turn upper operating nut (17B) or weathershield nut (101) in the opening direction separate the nozzle section (60) and the support (56). Remove the nozzle section. **Use proper handling techniques to avoid injury.**
4. Remove operating nut (17B or 17) from the nozzle section (60). (On hydrants with weathershield, it is necessary to drive out pin (102) and remove weathershield (101) before upper operating nut can be removed.)
5. Unscrew lower operating nut (17A - two- piece nuts, 17 - one-piece nut), and remove support tube (85).
6. Unscrew hex stop nut (86) from operating rod (71), and remove support (56).
7. Remove coupling nuts (87) and sleeves (67) from upper and lower rods (71 & 72). Carefully check upper rod (71) to make sure it is not bent more than 1/8 in. out of straightness. Straighten or replace if necessary. Also check studs (88) for thread damage or bending which will prevent the installation of a new coupling. Replace studs if necessary.
8. Position upper rod (71) over lower rod (72) and install new coupling halves (67). Install nuts (87) and tighten securely.

9. Remove lock ring (64) from the bottom of the upper standpipe (40). Remove old breakable flange (113) from the upper standpipe if it is still attached (in most cases, it will fracture and disengage itself from the upper standpipe). Slide new breakable flange (113) over the upper standpipe (40). Orient flange so that the larger ID of the flange will point down and properly engage the lock ring. Install lock ring (64) in the bottom groove of the upper standpipe (40). Slide flange (113) down and over the lock ring (64). See Figure 2, on Page 2A-25.
10. Place new gasket (92) on the lower standpipe with the lip pointing down. Position the upper standpipe (40) on the lower standpipe and install bolts (6B) thru flanges (113) and (63). Install nuts (6C) and tighten the four bolts evenly. Tighten to 60-70 ft-lbs of torque.
11. Grease O-ring and gasket grooves in support (56), and grease O-rings (59), gaskets (84) and lower tube seal (83). Tape threads of operating rod (71) to protect O-rings. Install support (56) onto operating rod (71), being careful not to damage O-rings on operating rod threads. Remove tape from threads.
12. Install hex stop nut (86), threading it down to end of thread. Snug up with a torque of 30 ft-lbs (30 lb at end of 12 in. wrench).
13. Grease O-ring in upper end of support tube (85). Slide tube down over operating rod (71) until it is seated on support (56).
14. Grease threads of operating rod (71) and lower bearing surface of operating nut (17A or 17). Screw lower operating nut onto rod while centering support (56) on the standpipe. Tighten operating nut (17A or 17) to securely clamp support (56) against upper standpipe (40). Be sure support (56) is centered on upper standpipe (40).
15. Grease and install thrust ring (90) and O-ring (57) in upper operating nut (17B or 17). If hydrant has a two-piece operating nut, set upper operating nut (17B) on lower operating nut (17A) and engage lugs in slots.

**Note:** Be sure to install the upper standpipe correctly. The groove at the top must be 3/4 in. from the end. The groove at the bottom must be 3/8 in. from the end. Also, the breakable flange (113) must be at the bottom (groundline) end of the upper standpipe. See Figure 2, on Page 2A-25.



## 4-3/4" Waterous Trend Model WB77-1 - Traffic Damage Repair

### Using Repair Kit K528

16. Carefully lower nozzle section (60) over upper operating nut (17B or 17) until it seats on support (56). Rotate nozzle section (60) to desired position. Install bolts (6A) and nuts (6C) through flange of nozzle section and flange (62B) and tighten finger tight. Be sure to install depth plate and washers (61) in proper position. Make sure flange (62B) is seated properly with flange lock ring (64) and tighten all bolts and nuts evenly. Tighten to 60-70 ft-lbs of torque.

17. Back off operating nut slightly to release tension on operating rod. Since water pressure will hold valve up against seat, it is not necessary to turn operating nut to a dead stop if the valve and seat are in good condition.

18. Lubricate hydrant as shown in Figure 3.

**Note: When a supply of gaskets and O-rings are available, always install new ones when reassembling the hydrant. Clean dirt from O-ring grooves.**

Figure 1. 4-3/4" WaterousTrend Model WB77-1

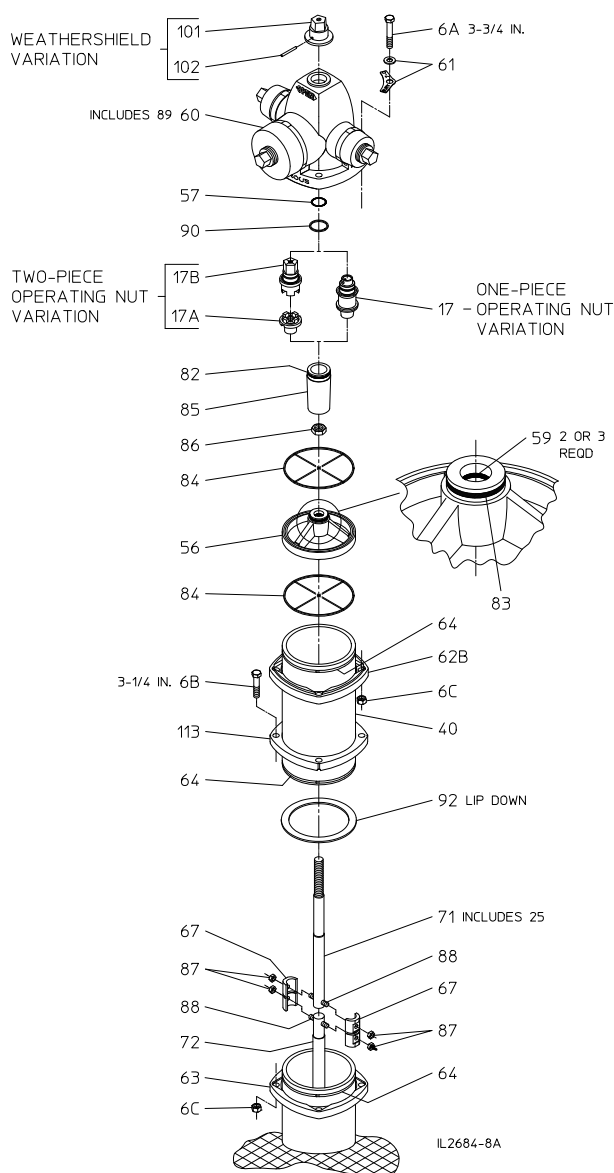


Figure 2. Upper Standpipe (Breakable Flange Orientation)

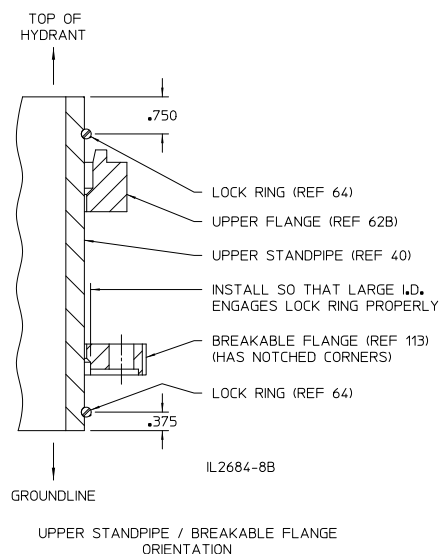
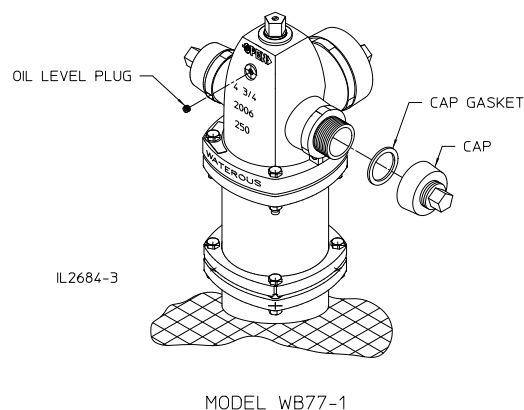


Figure 3. Lubrication Detail



1. Remove oil level plug and add oil to the level of the plug. Use an AMERICAN Flow Control recommended oil.
2. Remove all nozzle caps, clean rust or corrosion from threads of nozzles and caps. Replace cap gaskets if necessary. Apply a light coat of grease to nozzle threads before replacing cap. Use an AMERICAN Flow Control recommended food grade grease.





## 4-3/4" Waterous Trend - Nozzle Replacement

### Mechanically Attached Nozzles

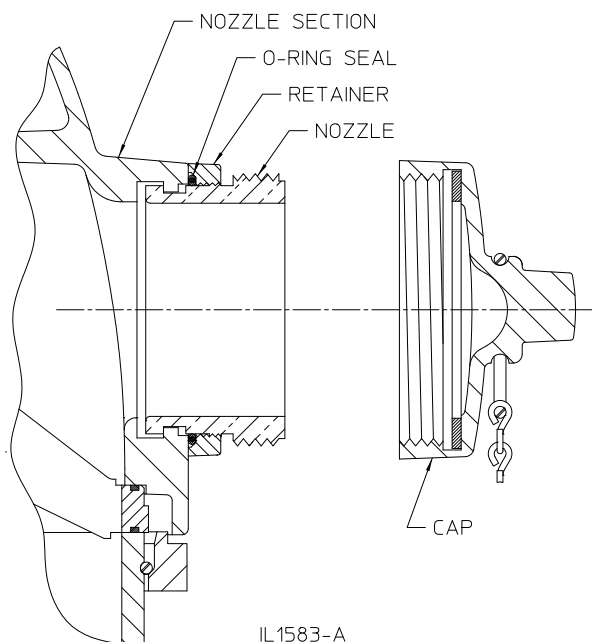
**WARNING: POTENTIAL HYDRANT CAP HAZARD. FAILURE TO RELIEVE PRESSURE CAN RESULT IN THE CAP BLOWING OFF, CAUSING SERIOUS INJURY OR DEATH.** Make sure the auxiliary gate valve in the lateral between the main and the hydrant is closed and that the hydrant is not charged with pressure when removing caps.

On the 4-3/4" Waterous Pacer fire hydrants that are equipped with Mechanically Attached nozzles, a retainer is threaded onto the nozzle, an O-ring against the face of the outlet socket of the nozzle section, creating a water tight seal.

Waterous has The following wrenches are available for removing and installing retainers.

- For Threaded Pumper Nozzles and 4-inch Storz Nozzles: Part No. 81420
- For 5 in. Storz Pumper Nozzles: Part No. 82766
- For 2½ inch Hose Nozzles: Part No. 72094

*Figure 1. Mechanically Attached Nozzles*



## 4-3/4" Waterous Trend - Nozzle Replacement Mechanically Attached Pumper Nozzle Removal



**WARNING: POTENTIAL HYDRANT CAP HAZARD. FAILURE TO RELIEVE PRESSURE CAN RESULT IN THE CAP BLOWING OFF, CAUSING SERIOUS INJURY OR DEATH.** Make sure the auxiliary gate valve in the lateral between the main and the hydrant is closed and that the hydrant is not charged with pressure when removing caps.

1. Carefully remove the cap while standing away from the direction of potential discharge.

2. Place wrench on the retainer so it engages the rounded protrusions and unthread from nozzle.

Removal of the 5-inch Storz hydrant nozzle requires the use of the hinged pumper-nozzle retainer wrench (Waterous Part No. 82766).

3. Rotate nozzle counterclockwise until the four lugs on the nozzle disengage the recesses in the nozzle section socket which will allow the nozzle to be removed.

### Installation

1. Thread retainer onto the retainer threads of the pumper nozzle.
2. Grease O-ring and place it over nozzle starting from the end with the four lugs and into the chamfer recess in the retainer.
3. Insert the nozzle/retainer/O-ring subassembly into the socket in the nozzle section. Rotate the subassembly clockwise until it stops with the four lugs on the nozzle fully engaged in the anti-rotation recesses in the socket. If it cannot be rotated, turn the retainer in a direction to allow the nozzle to be inserted further into the socket so the subassembly rotates clockwise against the stops.
4. Hand tighten the retainer to press O-ring against the face of the socket.

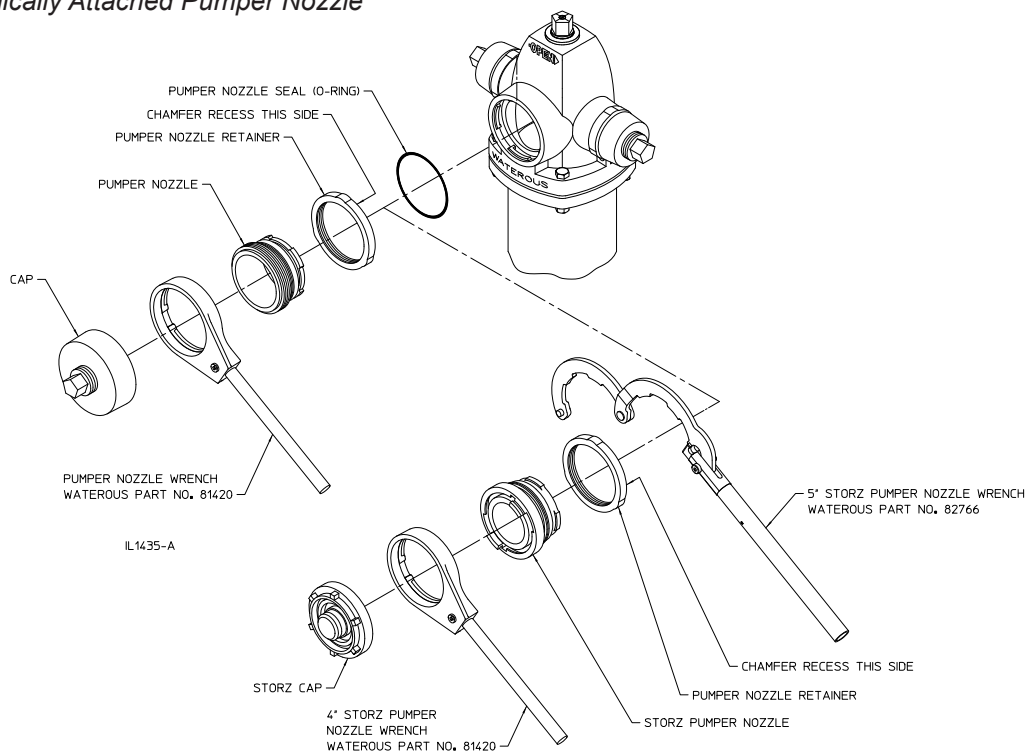
5. Place wrench on the retainer so it engages the rounded protrusions, tighten firmly.

Installation of the 5-inch Storz hydrant nozzle requires the use of the hinged pumper-nozzle retainer wrench (Waterous Part No. 82766).

6. Clean rust or corrosion from cap threads and replace cap gasket if necessary. Apply a light coat of grease to the nozzle threads and install the cap.
7. Cap all nozzles and open the hydrant valve, check the area around the repaired nozzle for leaks.

**NOTE: Where grease is specified, use an AMERICAN Flow Control recommended food grade grease.**

Figure 2. Mechanically Attached Pumper Nozzle





## 4-3/4" Waterous Trend - Nozzle Replacement Mechanically Attached 2-1/2" Hose Nozzle

### Removal

**WARNING: POTENTIAL HYDRANT CAP HAZARD. FAILURE TO RELIEVE PRESSURE CAN RESULT IN THE CAP BLOWING OFF, CAUSING SERIOUS INJURY OR DEATH.** Make sure the auxiliary gate valve in the lateral between the main and the hydrant is closed and that the hydrant is not charged with pressure when removing caps.

1. Carefully remove the cap while standing away from the direction of potential discharge.

2. Place wrench on the retainer so it engages the rounded protrusions and unthread from nozzle.
3. Rotate nozzle counter-clockwise until the two lugs on the nozzle disengage the recesses in the nozzle section socket which will allow the nozzle to be removed.

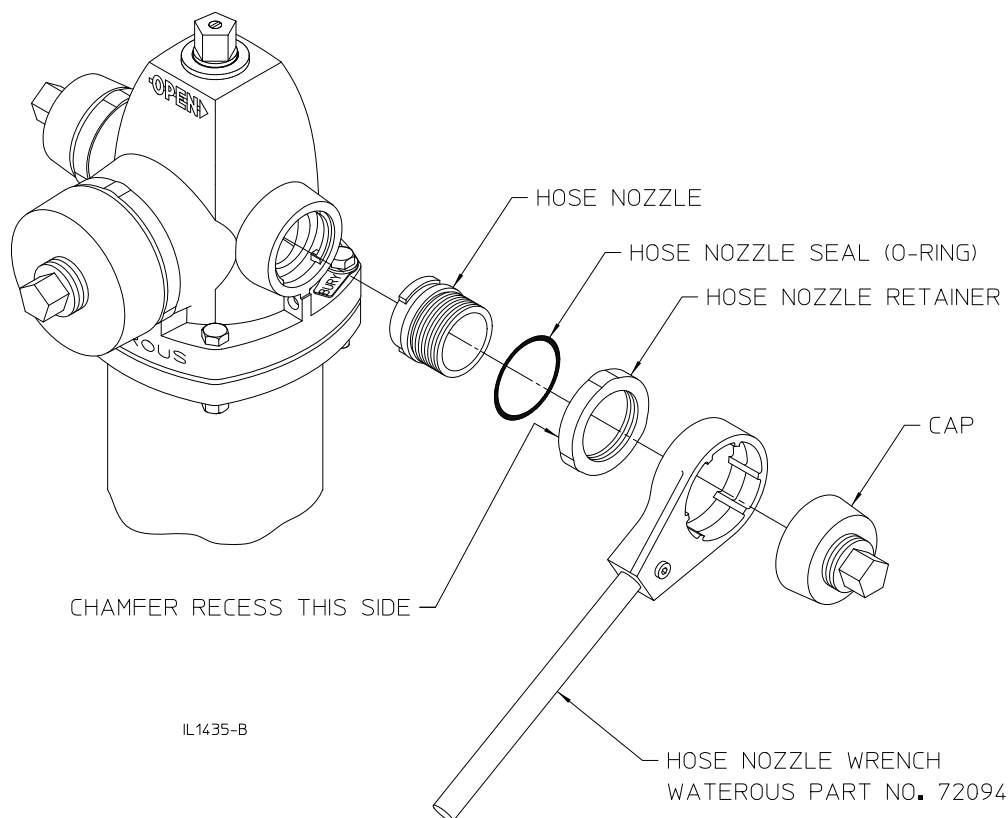
### Installation

1. Insert hose nozzle into the socket of the nozzle section, turn clockwise until it stops with the two lugs on the nozzle fully engaged in the anti-rotation recesses in the socket.
2. Grease O-ring and place it over the nozzle and against the face of the socket.
3. Thread retainer onto the hose nozzle and hand tighten to press the O-ring against the face of the socket.

4. Place wrench on retainer so it engages the rounded protrusions, and tighten firmly.
5. Clean rust or corrosion from cap threads and replace cap gasket if necessary. Apply a light coat of grease to the nozzle threads and install the cap.

**NOTE: Where grease is specified, use an AMERICAN Flow Control recommended food grade grease.**

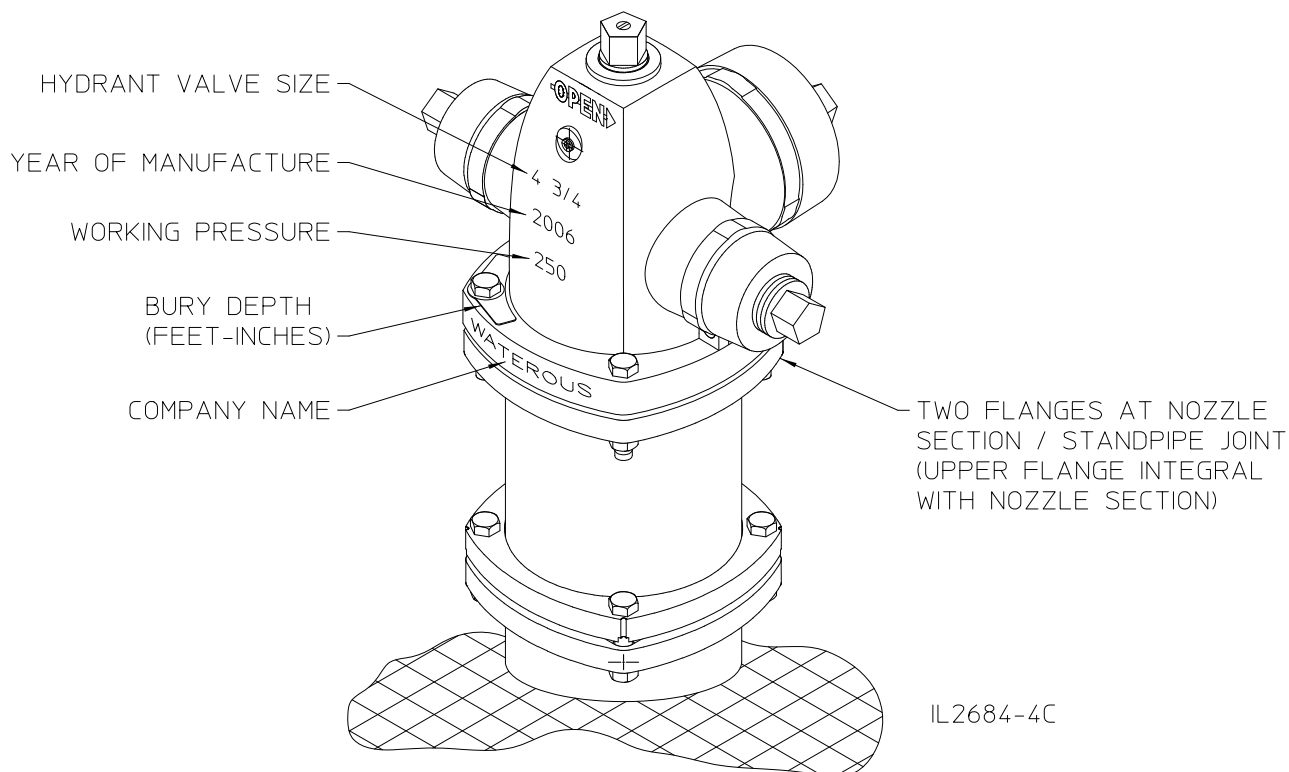
Figure 3. Mechanically Attached Hose Nozzle





## 4-3/4" Waterous Trend Model WB77-1 - Extension Instructions Using Standpipe and Rod Extension Kit K562

### Identification Diagram



MODEL WB77-1: BUILT FROM 2006 TO PRESENT

### Important Notes

1. AMERICAN recommends a new rod corresponding to the extended bury or cover depth be installed in place of a rod extension if the hydrants meet one or more of the following criteria:
  - a. The length of the rod extension required exceeds 4 ft-0 in..
  - b. The hydrant has already been extended. Only one rod extension per hydrant is recommended.
2. If extended depth of hydrant will exceed 11 ft-6 in. bury, a "bottom extension" should be installed in place of a standpipe and rod extension.
3. Contact AMERICAN for appropriate parts and guidance if any of the above situations exist.

## 4-3/4" Waterous Trend Model W77B-1 – Extension Instructions

### Using Standpipe and Rod Extension Kit K562



**WARNING:** Special care should be taken in the installation, inspection and repair of pressure containing devices such as valves and hydrants. **FAILURE TO FOLLOW PROPER PRACTICE AND GUIDELINES CAN RESULT IN SERIOUS INJURY OR DEATH.** High pressure and water hammer, due to rapid opening or closing of a hydrant or valve, can also cause major damage to the hydrant, valve, water main, fire hose, or other attached equipment.

**Note:** Where grease is specified, use an **AMERICAN Flow Control** recommended food grade grease.

1. Close hydrant valve. It is considered safe practice to close the auxiliary valve ahead of the hydrant, or use another means to cut off flow and pressure to the hydrant. Always standing to the side of the hydrant and away from the direction of the hydrant caps, loosen one of the hose caps to relieve any pressure that may be present in the hydrant barrel. **WARNING: FAILURE TO RELIEVE PRESSURE CAN RESULT IN THE CAP BLOWING OFF, CAUSING SERIOUS INJURY OR DEATH.**  
**See Figure 2 , Page 2A-31**
2. At the nozzle section, remove bolts (6A), nuts (6C), and allow flange (62B) to slide down the upper standpipe. Depth plate and washer (61) will come off with bolts.
3. Turn upper operating nut (17B) or weathershield nut (101) in the opening direction to separate the nozzle section (60) and the support (56). Remove the nozzle section, lifting upwards. **Use proper handling and lifting techniques to avoid injury.**
4. Remove operating nut (17B or 17) from the nozzle section (60). (On hydrants with weathershield, it is necessary to drive out pin (102) and remove weathershield (101) before upper operating nut can be removed.)
5. Unscrew lower operating nut (17A - two- piece nuts, 17 - one-piece nut), and remove support tube (85).
6. Unscrew hex stop nut (86) from operating rod (28), and remove support (56).
7. Remove bolts (6B) and nuts (6C) and lift off upper standpipe (40). Discard gasket (92), bolts (6B) and nuts (6C). Note that flange (113) and (62B) will remain attached to the upper standpipe (40). It is not necessary to remove these flanges. They may remain on the upper standpipe.
8. Safely disassemble breakable coupling. Unscrew nuts (87) and remove rod coupling halves (67) which join the upper rod (71) to the lower rod (72). Do not remove studs (88) unless they are damaged.
9. Install rod extension (74) on existing lower rod (72) using extension couplings (174). Slide coupling halves (174) onto studs in rod extension (74) and lower rod (72) and install nuts (87). Note: Be sure extension couplings are installed at the original ground line. Refer to Figure 4 on Page 2A-31.
10. Install flanges (63) and lock rings (64) onto standpipe extension (45). Be sure to orient flanges properly. Refer to Figure 3 on Page 2A-31.
11. Install gasket (92) on existing standpipe with lip pointing down. Install standpipe extension (45) on existing standpipe. Install bolts (6D) and nuts (6C) thru flanges (63) and tighten finger tight. Make sure flanges (63) are seated properly on lock rings (64) and tighten all bolts and nuts evenly. Tighten to 60-70 ft-lbs torque.
12. Install existing upper rod (71) onto rod extension (74) using breakable couplings (67). Slide coupling halves (67) onto studs in rod extension (74) and upper rod (71) and install nuts (87). Note: Be sure breakable couplings are installed at the new ground line. Refer to Figure 4 on Page 2A-31.
13. Install gasket (92) on standpipe extension (45) with lip pointing down. Install existing upper standpipe (40) on standpipe extension. Install bolts (6B) and nuts (6C) thru flanges (113) and (63) and tighten finger tight. Be sure flanges engage lock rings (64) properly and tighten all bolts and nuts evenly. Note that breakable flange (113) must be on the bottom of the upper standpipe. Also, upper standpipe (40) must be installed properly with the groove 3/4 in. from the end at the top and the groove 3/8 in. from the end at the bottom. Refer to Figure 4 on Page 2A-31.
14. Grease O-ring and gasket grooves in support (56), and grease O-rings (59), gaskets (84) and lower tube seal (83). Tape threads of operating rod (71) to protect O-rings. Install support (56) onto operating rod (71), being careful not to damage O-rings on operating rod threads. Remove tape from threads.
15. Install hex stop nut (86), turning it down to end of thread. Snug up with a torque of 30 ft-lbs (30 lb at end of 12 in. wrench).
16. Grease O-ring in upper end of support tube (85). Slide tube down over operating rod (71) until it is seated on support (56).
17. Grease threads of operating rod (71) and lower bearing surface of operating nut (17A or 17). Screw lower operating nut onto rod while centering support (56) on the standpipe. Tighten operating nut (17A or 17) to securely clamp support (56) against upper standpipe (40). Be sure support (56) is centered on upper standpipe (40).
18. Grease and install thrust ring (90) and O-ring (57) in operating nut (17B or 17). If hydrant has a two piece operating nut, set upper operating nut (17B) on lower operating nut (17A) and engage lugs in slots.

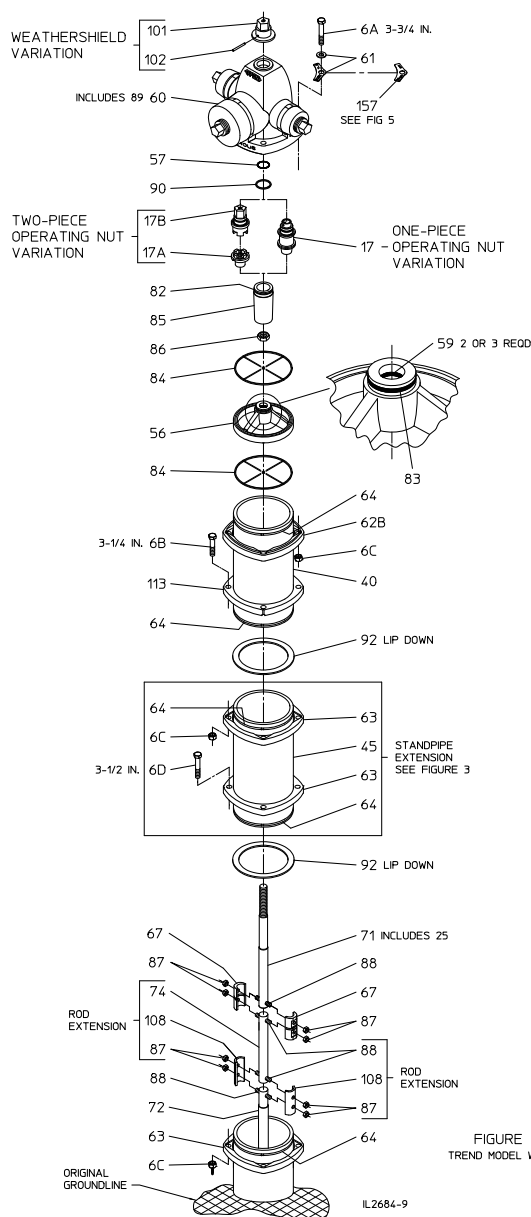


## 4-3/4" Waterous Trend Model WB77-1 - Extension Instructions

### Using Standpipe and Rod Extension Kit K562

19. Carefully lower nozzle section (60) over operating nut (17b or 17) until it seats on support (56). Rotate nozzle section (60) to desired position. Install bolts (6A) and nuts (6C) through flange of nozzle section and flange (62B) and tighten finger tight. Be sure to install depth plate and washers (61) in proper position. Also install extension plate (157) opposite the bury depth plate (see Figure 5 on Page 2A-32). Make sure flange (62B) is seated properly with lock ring (64) and tighten all bolts and nuts evenly. Tighten to 60-70 ft-lbs of torque.
  20. Back off operating nut slightly to release tension on operating rod. Since water pressure will hold valve up against seat, it is not necessary to turn operating nut to a dead stop if the valve and seat are in good condition.
  21. Lubricate hydrant as shown in Figure 6 on Page 2A-32.
- Note: When a supply of gaskets and O-rings are available, always install new ones when reassembling the hydrant. Clean dirt from O-ring grooves.**

Installation Diagram - 4-3/4" Waterous Trend Model WB77-1







## 4-3/4" Waterous Trend Model WB77-1 - Extension Instructions

### Using Standpipe and Rod Extension Kit K562

Figure 3. Standpipe Extension / Flange Orientation

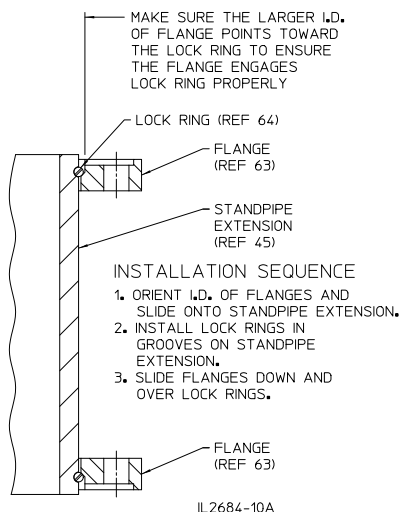


Figure 5. Extension Plate Installation

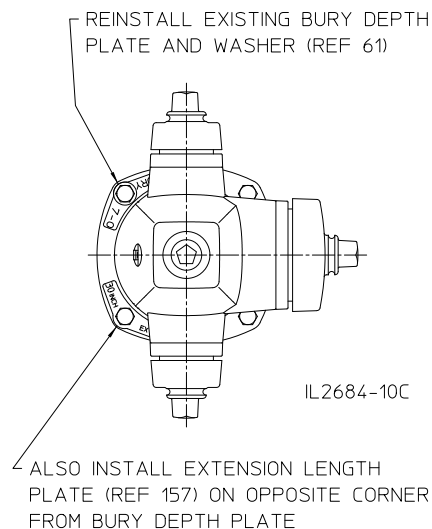


Figure 4. Extension Parts / Existing Parts Orientation

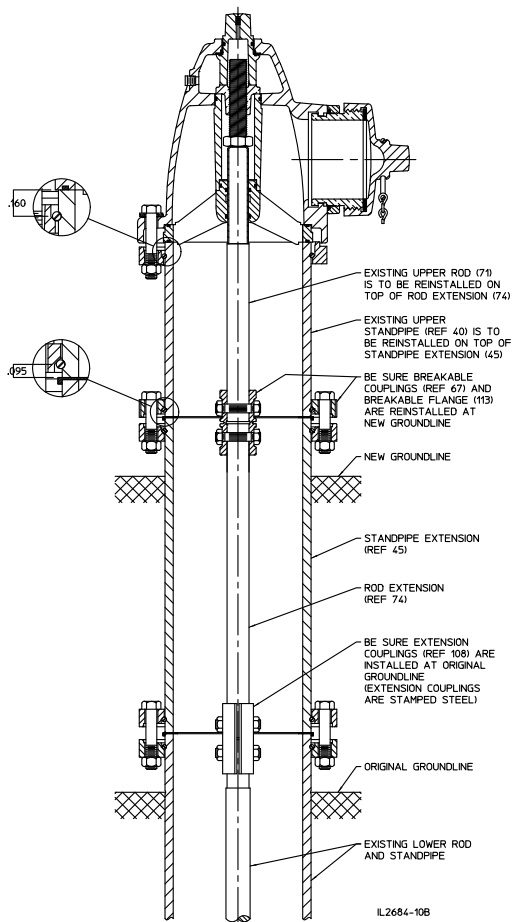
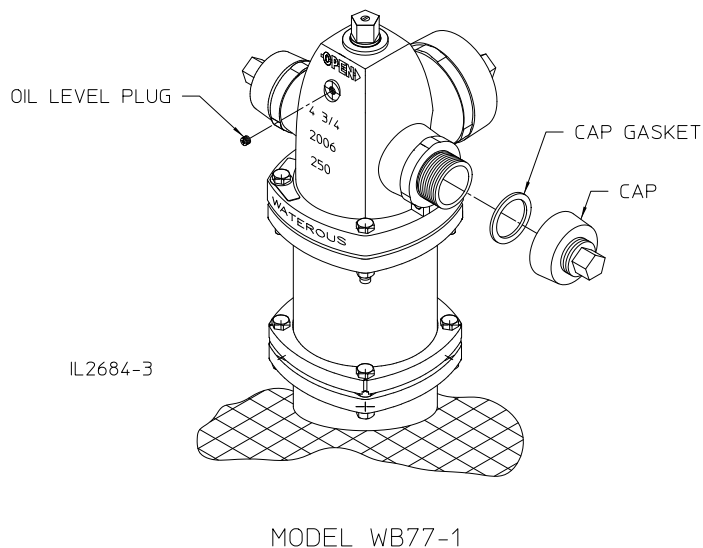


Figure 6. Lubrication Detail



1. Remove oil level plug. Add oil to the level of the plug. Use an AMERICAN Flow Control recommended oil.
2. Remove all nozzle caps, clean rust or corrosion from threads of nozzles and caps. Replace cap gaskets if necessary. Apply a light coat of grease to nozzle threads before replacing cap. Use an AMERICAN Flow Control recommended food grade grease.



# AMERICAN

## FLOW CONTROL

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