

Operating and Maintenance Manual

**MAINGUARD #77**  
  
**&**  
  
**MAINGUARD #78**

**Kupferle Water Solutions**

1291 N Highway Drive  
Fenton, Missouri  
63026, USA

Tel: 1-800-231-3990  
Tel: 314-231-8738  
Fax: 314-231-2820

Disclaimer: While this document is complete, comprehensive, and accurate to the best of Kupferle's knowledge, this document is subject to change and is for general information purposes only.



# Table of Contents

<b>Table of Contents</b>	<b>2</b>
<b>DESCRIPTION</b>	<b>3</b>
<b>General Description</b>	<b>3</b>
Mainguard #77	3
Mainguard #78	3
<b>Layout</b>	<b>4</b>
Mainguard #77	4
Mainguard #78	5
<b>INSTALLATION</b>	<b>6</b>
<b>OPERATION</b>	<b>8</b>
Operation	8
<b>MAINTENANCE</b>	<b>9</b>
Removing and Replacing the Operating Assembly	9
Changing Plunger O-ring	10
Changing Seat Rubber	10
Replacing the Plunger Assembly	10
<b>TROUBLESHOOTING</b>	<b>11</b>
Blow-Off Station Will Not Shut Off	11
<b>ORDERING REPLACEMENT PARTS</b>	<b>11</b>
<b>CUT SHEETS</b>	<b>12</b>



## **DESCRIPTION**

### **General Description**

#### **Mainguard #77**

The Mainguard #77 is an above-ground, self-draining, non-freezing blow-off hydrant with a specified depth of bury. The inlet options are 2" FIP vertical, 2" FIP horizontal, or 2" MJ horizontal. A non-turning operating rod opens with 4-6 rotations to the left using the operating screw to be fully open. The outlet is 2-1/2" NST extending a minimum of 12" above the ground.

All water flows through 2" steel pipe coated with fusion bonded epoxy (FBE). The drive mechanism raises and lowers a plunger to control the flow of water. This operates with the operating screw, which fits a standard universal slotted valve wrench. The top cap and operating screw are contained in a removable cast iron locking cover. When the flow is fully open, the drain hole is covered, and when the flow is closed, the drain hole opens, draining the 2" pipe and preventing freezing accordingly.

All operating parts of the unit can be serviced or replaced above ground without digging up or disturbing the supply line connection.

#### **Mainguard #78**

The Mainguard #78 is a below-ground, self-draining, non-freezing blow-off hydrant with a specified depth of bury. The inlet options are 2" FIP vertical, 2" FIP horizontal, or 2" MJ horizontal. A non-turning operating rod opens with 4-6 rotations to the left using the operating screw to be fully open. The outlet can be either 2-1/2" NST or a .2" aluminum type F quick disconnect. The blow-off should be housed in a standard meter box with at least a 10" opening.

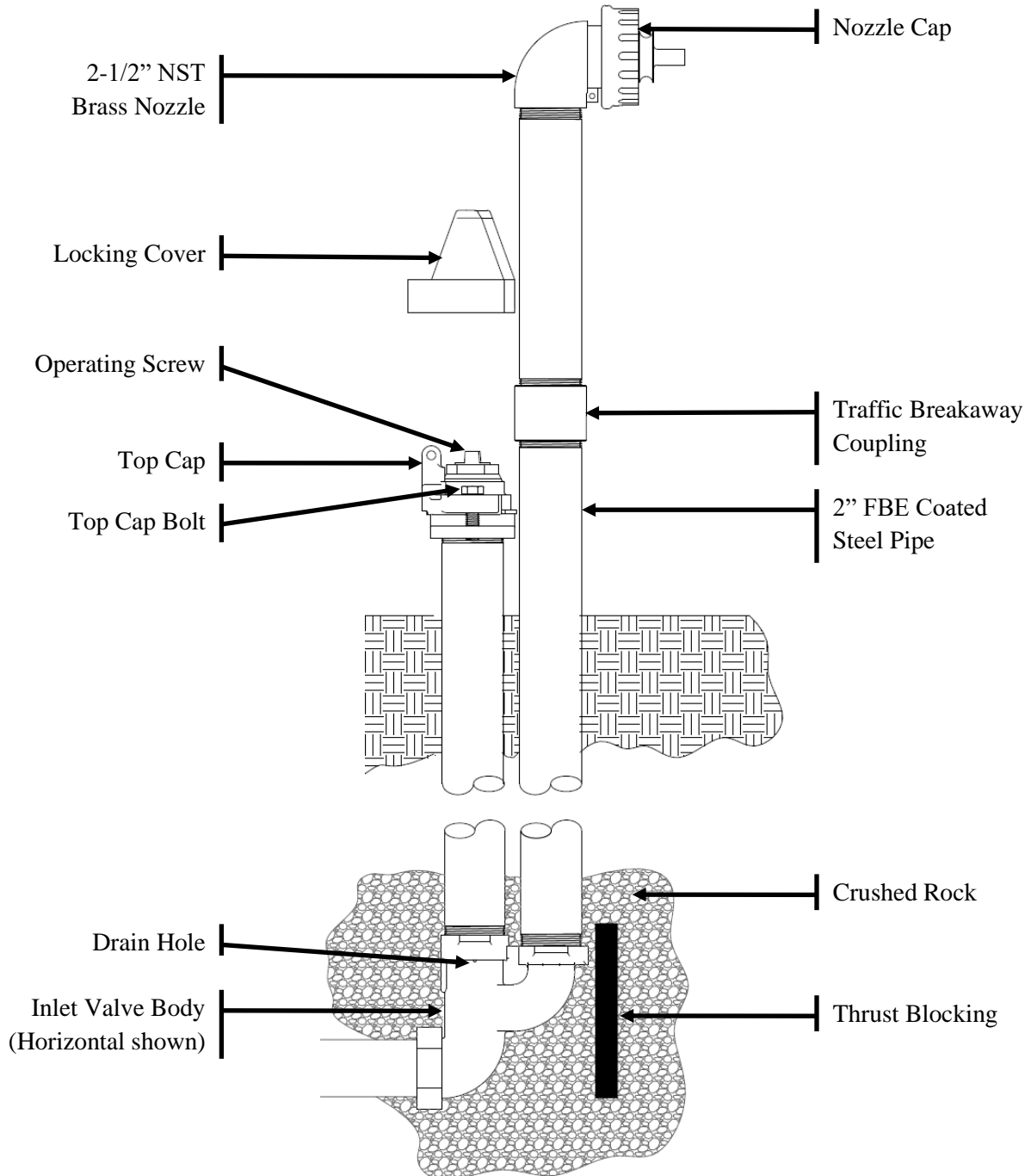
All water flows through 2" steel pipe coated with fusion bonded epoxy (FBE). The drive mechanism raises and lowers a plunger to control the flow of water. This operates with the operating screw, which fits a standard universal slotted valve wrench. The top cap and operating screw are contained in a removable cast iron locking cover. When the flow is fully open, the drain hole is covered, and when the flow is closed, the drain hole opens, draining the 2" pipe and preventing freezing accordingly.

All operating parts of the unit can be serviced or replaced from the meter box without digging up or disturbing the supply line connection.



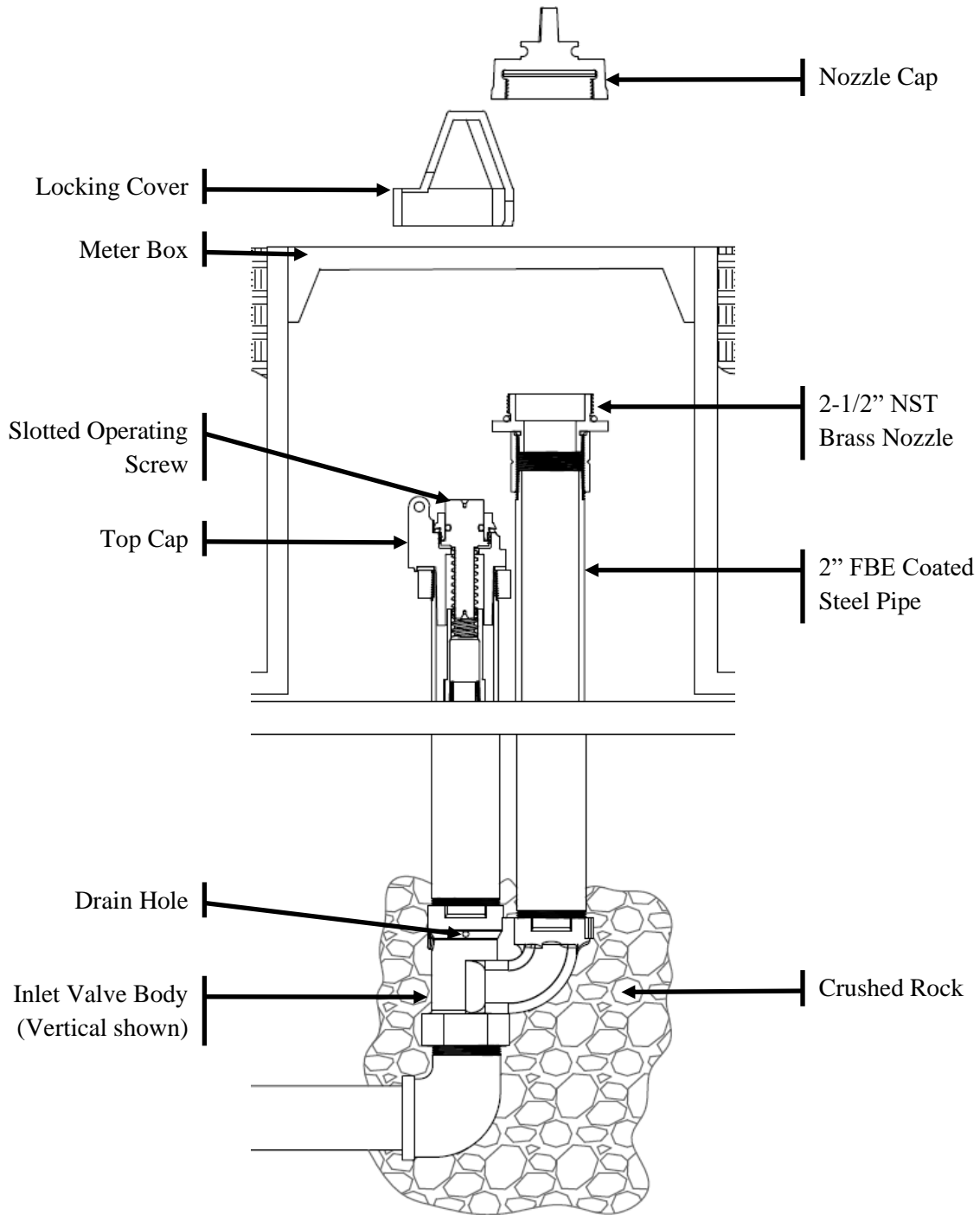
## Layout

### Mainguard #77





## Mainguard #78



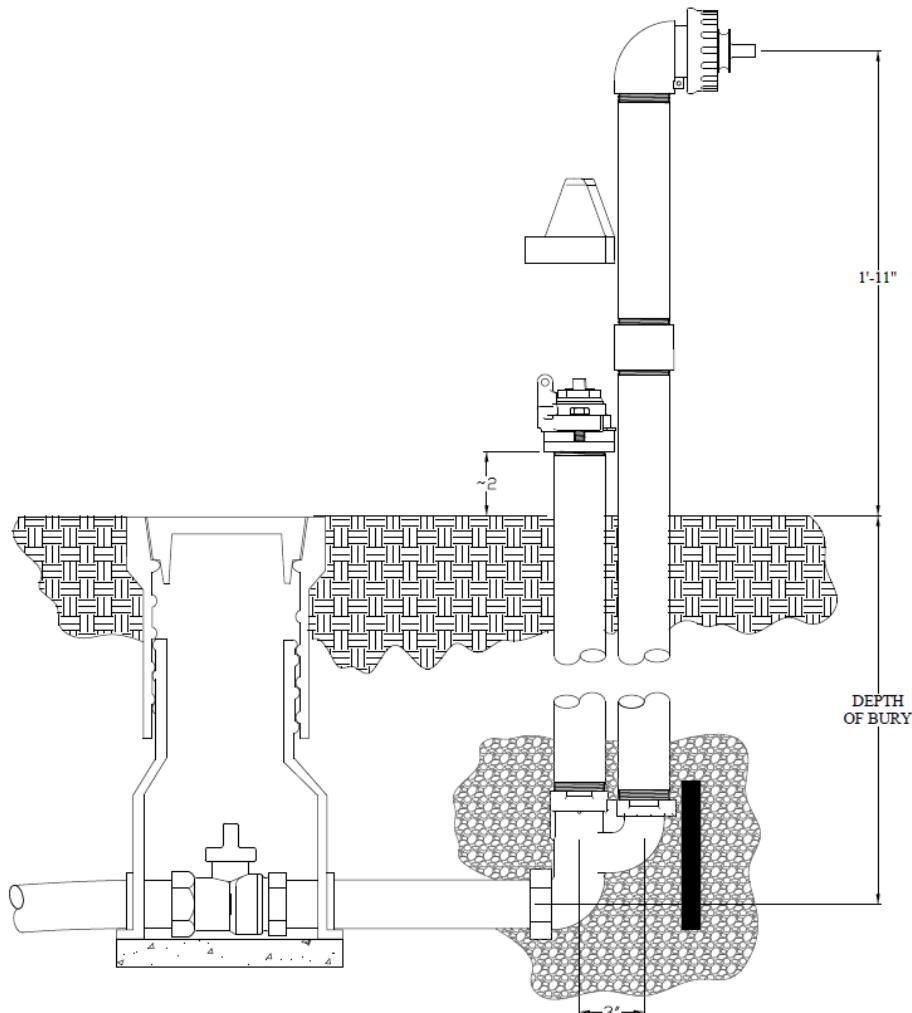


# INSTALLATION

NOTE: Kupferle recommends the installation of a corporation or curb stop prior to the blow-off for increased serviceability and maintenance.

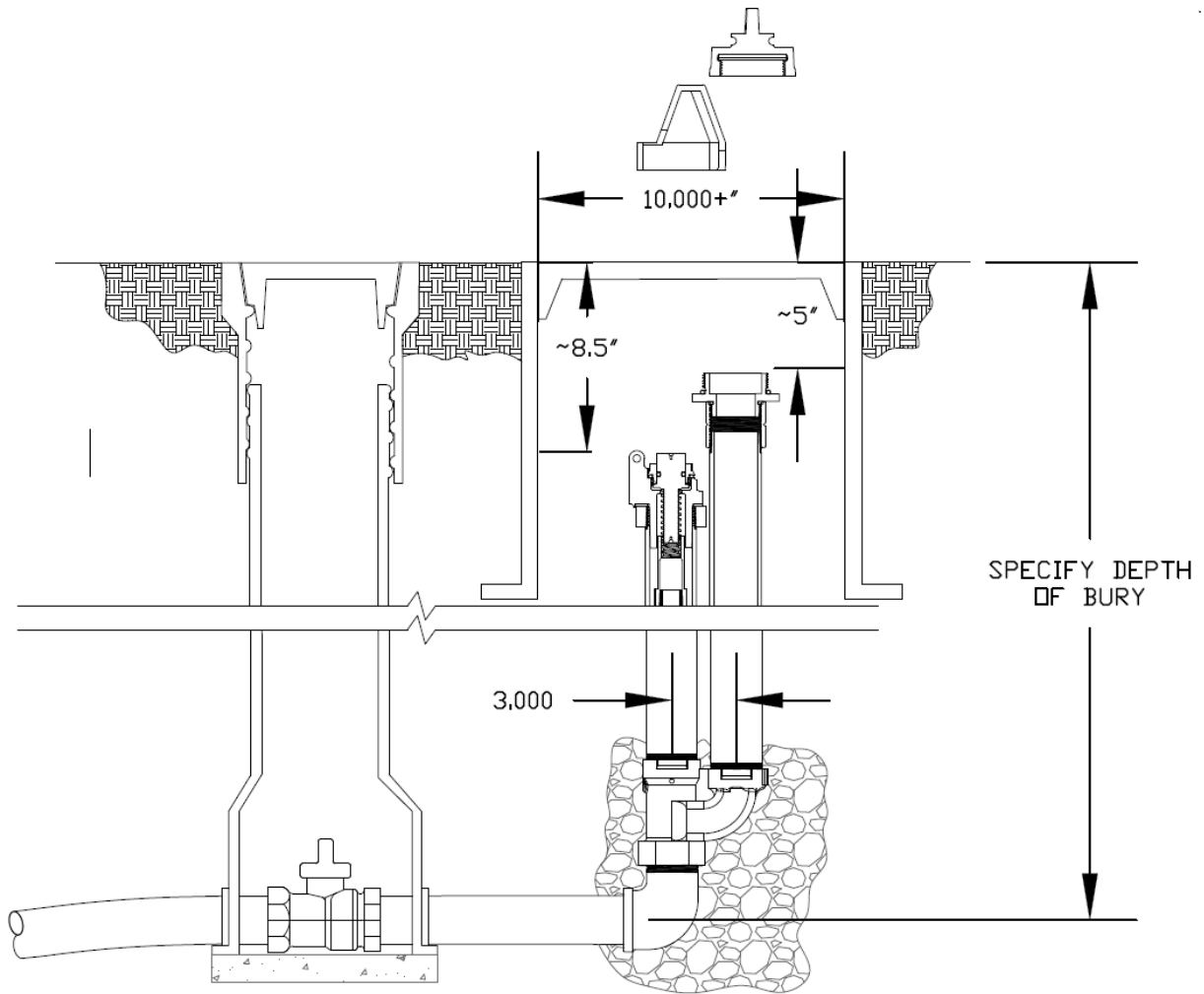
1. The supply lines must be flushed free of any rock, gravel, or other debris before connecting the hydrant or installing any new or replacement parts.
2. Flusher to be connected to the supply line via the 2" FIP inlet or 2" MJ connection.
3. The hydrant must be set in 4 cubic feet of crushed rock so it can drain properly.
4. Station shall be backfilled with clean dirt up.
  - a. The #77 should be backfilled to about 2" below the bottom of the top cap.
  - b. The #78 should be backfilled to the top of the meter box. The top of the outlet should be about 5" below grade.

## Mainguard #77





## Mainguard #78





# **OPERATION**

## **Operation**

The blow-off is operated by turning the operating screw with a standard universal slotted wrench. 4-6 rotations of the operating screw counterclockwise will open the hydrant fully. Turn clockwise to close.

1. Remove the locking cover.
2. Remove the nozzle cap. Hook up a hose to the outlet if desired.
3. Use a standard universal slotted wrench to turn the operating screw counterclockwise. 4-6 rotations of the operating screw will open the blow-off fully.
4. Turn the operating screw clockwise to close.
5. Replace the nozzle cap and locking cover.

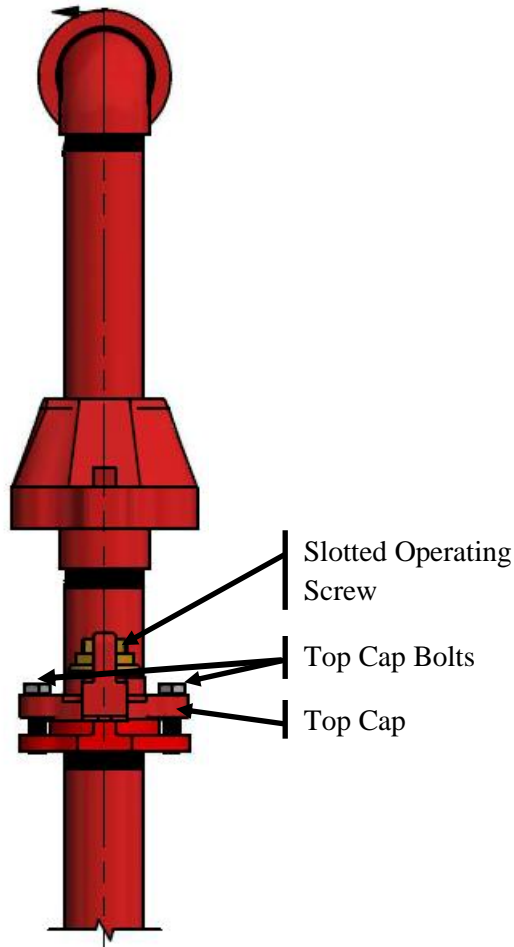


# MAINTENANCE

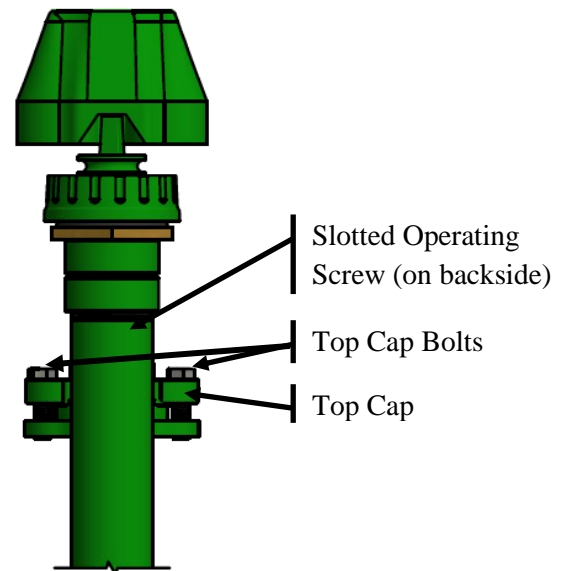
**NOTE:** The water supply must be turned off before maintenance can be performed, typically via the valve box leading to the hydrant.

## Removing and Replacing the Operating Assembly

**Mainguard #77**



**Mainguard #78**

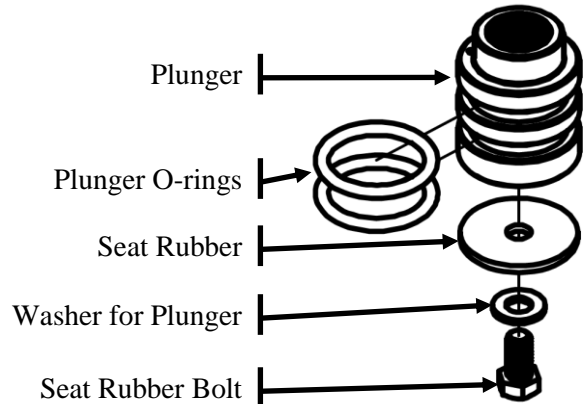


1. Shut off water supply leading to blow-off station.
2. Open the flow all the way using the operating screw (turn counterclockwise).
3. Remove the top cap bolts using a 3/4" wrench (turning counterclockwise).
4. Pull straight up on the top cap without turning to remove all inner working parts from the blow-off station.
5. Perform maintenance.
6. Before replacing inner working parts, turn water supply back on, flushing out any sediment or debris that may have accumulated, then turn back off.
7. Reassemble the station reversing steps 1-4.



## Changing Plunger O-ring

1. Remove the operating assembly to above ground.  
Refer to Removing the Operating Assembly above.
2. Remove and replace plunger O-rings.
3. Replace the operating assembly.



## Changing Seat Rubber

1. Remove the operating assembly to above ground.  
Refer to Removing the Operating Assembly above.
2. Unfasten the seat rubber bolt with a 1/2" socket.  
Remove the bolt and washer.
3. Remove and replace the seat rubber.
4. Replace the operating assembly.

## Replacing the Plunger Assembly

1. Remove the operating assembly to above ground. Refer to Removing the Operating Assembly above.
2. Use a pipe wrench to unscrew the plunger from the operating rod.
3. Thread the new plunger assembly onto the operating rod. Tighten with a pipe wrench.
4. Replace the operating assembly.



## **TROUBLESHOOTING**

### **Blow-Off Station Will Not Shut Off**

Examine seat rubber and plunger o-rings for any signs of wear or damage. Replace part(s) as needed.  
(Seat Rubber PN: #77I; Plunger O-rings PN: #77D; Washer PN: #77W; Plunger PN: #77L; Seat Rubber Bolt PN: #77C; Plunger Complete PN(plunger, o-rings, seat rubber, washer, bolt): X77L) See Maintenance section for instructions.

## **ORDERING REPLACEMENT PARTS**

Replacement parts may be ordered from any water works distributor. A list of distributors may be obtained by calling Kupferle at 800-231-3990 or by visiting Kupferle's website.

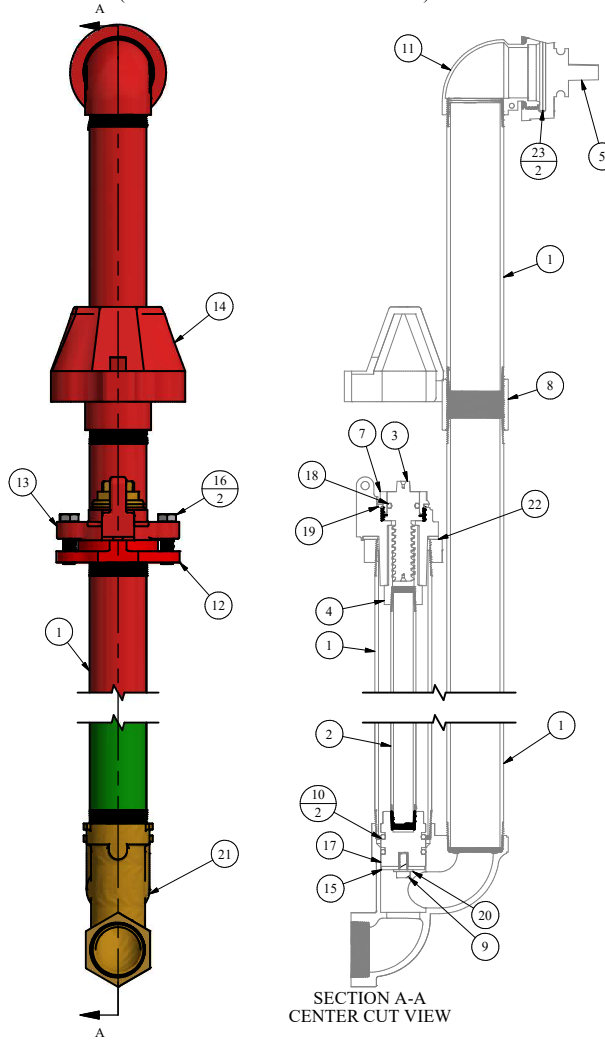
Parts lists are also available on Kupferle's website.

<http://www.hydrants.com>



# #77 CUT SHEET

(HORIZONTAL INLET 2-1/2" OUTLET)



## PARTS LIST

ITEM	QTY	PART NUMBER	DESCRIPTION	NOTES
1	86,000 in	2FBE	2" EXTERNALLY FBE COATED IRON PIPE	
2	31,750 in	3/4GAL	3/4" GALVANIZED PIPE	
3	1	4B	SLOTTED TOP SCREW	
4	1	510	CONNECTING NUT	C
5	1	592-C	2-1/2" NST SIDE CAP (SMALL SQUARE)	
6	1	595	PEAR RING, CHAIN, S-HOOK ASSEMBLY	A
7	1	721	MAINGUARD PACKING NUT	
8	1	77A	TRAFFIC BREAKAWAY COUPLING	C,S
9	1	77C	SEAT RUBBER BOLT	
10	2	77D	PLUNGER O-RING	C
11	1	77E	BRASS NOZZLE (2-1/2 NST)	C
12	1	77F	NECK	C
13	1	77GA	TOP CAP	
14	1	77H	LOCKING COVER	C,S
15	1	77I	SEAT WASHER	C
16	2	77K	TOP CAP BOLT	C
17	1	77L	PLUNGER	
18	1	77M	O-RING FOR SLOTTED SCREW	C
19	1	77MG	PACKING NUT GASKET	C
20	1	77W	WASHER FOR PLUNGER	
21	1	79V	BRASS 2" SIDE INLET VALVE	C
22	1	A1	TOP CAP GASKET	C
23	2	A16	NOZZLE CAP GASKET	C

## OPTIONS / REPAIR PARTS ONLY

24	0	2MJG	2" MECHANICAL JOINT GLAND	
25	0	2TG	2" TRANSITION GLAND	
26	0	707	2" MJ IRON ADAPTER	
27	0	77CL	IRON CLAMP	C
28	0	77J	BRASS 2" STRAIGHT INLET VALVE	C
29	0	77P	BOLT FOR CLAMP	C
30	0	77Q	NUT FOR CLAMP	C
31	0	79W-IRON	IRON VALVE 2" MJ 90°	A
32	0	85LHW	LONG HANDLE WRENCH	A
33	0	CORTEN	MJ BOLT AND NUT	

## OLD STYLE PARTS LIST

34		4-77	"OLD STYLE" SQUARE TOP SCREW	A
35		4A	"OLD STYLE" SLOTTED TOP SCREW	A
36		620	"OLD STYLE" PACKING NUT	A
37		621	"OLD STYLE" PACKING NUT	A
38		77N	O-RING FOR TOP SCREW	A,C
39		77O	"OLD STYLE" PACKING NUT GASKET	A,C

## REPAIR KITS

PART NUMBER	DESCRIPTION	PARTS INCLUDED	NOTES
X4B	"NEW STYLE" SLOTTED TOP SCREW COMPLETE	4B SCREW (1), 77M O-RING (1)	DUE TO COMPATIBILITY, IT IS RECOMMENDED THAT X4B BE ORDERED WITH 510 - CONNECTING NUT
X592C	NOZZLE CAP COMPLETE 2-1/2" NST	592-C SIDE CAP (1), A16 GASKET (2), 595 CHAIN ASSEMBLY (1)	
X707	2" MJ BRASS ADAPTER	707 2" BRASS MJ ADAPTER (1), 2MJG GLAND (1), 2TG 2" TRANSITION GASKET (1), CORTEN MJ BOLT AND NUT (2)	
X721	"NEW STYLE" PACKING NUT WITH GASKET	721 PACKING NUT (1), 77MG GASKET (1)	SEE X77OPASSY
X77EXT-6	MAINGUARD EXTENSION - FIRST 6"	2FBE EXTERNALLY FBE COATED STEEL PIPES (2), 3/4GAL OPERATING ROD (1), 3/4C COUPLING (1), 77A COUPLING (1), 77F NECK (2), 629A-B-SS BOLT (2), 857 GASKET (1)	
X77EXT-XX	MAINGUARD EXTENSION - EACH ADDITIONAL 6"	2FBE EXTERNALLY FBE COATED STEEL PIPES (2), 3/4GAL OPERATING ROD (1), 3/4C COUPLING (1), 77A COUPLING (1), 77F NECK (2), 629A-B-SS BOLT (2), 857 GASKET (1)	
X77GA	IRON TOP CAP COMPLETE	77GA TOP CAP (1), A1 GASKET (1) 77K BOLT (2)	SEE X77OPASSY
X77L	PLUNGER COMPLETE	77L PLUNGER (1), 77D O-RING (2), 77I SEAT WASHER (1), 77W WASHER (1), 77C BOLT (1)	
X77OPASSY	77 OPERATING ASSEMBLY - RED (NOTE 4)	4B SCREW (1), 77M O-RING FOR SCREW (1), 510 CONNECTING NUT (1), 721 PACKING NUT (1), 77MG GASKET (1), 77GA TOP CAP (1), A1 GASKET (1), 77K BOLT (2)	RECOMMENDED FOR ALL REPAIRS
X77R	RISER FOR 77	77E NOZZLE (1), 2FBE EXTERNALLY FBE COATED STEEL PIPE (12"), 592-C SIDE CAP (1), A16 GASKET (2), 595 CHAIN ASSEMBLY (1)	
X77RK	REPAIR KIT	77D O-RING (2), 77I SEAT WASHER (1), 77W WASHER (1)	

## OLD STYLE REPAIR KITS

X4-77	"OLD STYLE" SQUARE TOP SCREW COMPLETE	4-77 SCREW (1), 77N O-RING (1)	USED BEFORE APRIL 1995
X4A	"OLD STYLE" SLOTTED TOP SCREW COMPLETE	4A SCREW (1), 77M O-RING	USED APRIL 1995 TO JANUARY 2012
X620	"OLD STYLE" PACKING NUT WITH GASKET	620 PACKING NUT (1), 77O GASKET (1)	USED BEFORE APRIL 1995
X621	BRASS PACKING NUT COMPLETE	621 PACKING NUT (1), 77MG GASKET (1)	USED APRIL 1995 TO JANUARY 2012
X77RK-OLD	"OLD STYLE" REPAIR KIT	77D O-RING (2), 77I-1/2 "OLD STYLE" SEAT WASHER (1), 77W WASHER (1)	USED BEFORE APRIL 1995

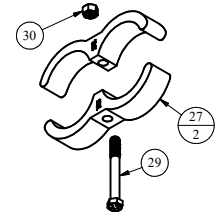
NOTE	DESCRIPTION
A	NOT SHOWN
B	PIPE LENGTH DEPENDENT ON DEPTH OF BURY, SHOWN AS 3'
C	SOLD AS REPLACEMENT PART
S	SPECIFY COLOR ON ORDER

**DISCLAIMER**  
THIS DRAWING IS THE PROPERTY OF KUPFERLE WATER SOLUTIONS. IT IS NOT TO BE USED OR DUPLICATED WITHOUT THE PERMISSION OF THE OWNER.

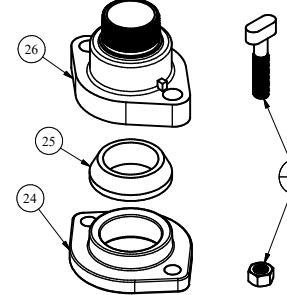
## LEGEND

X	STANDARD TAG
X/Y	TAG WITH Y QUANTITY

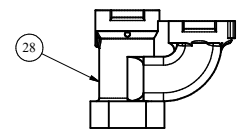
## OPTIONAL CLAMP ASSEMBLY (STANDARD ON D.O.B.'S OVER 5')



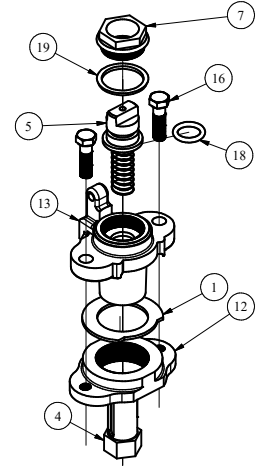
## OPTIONAL MJ ADAPTER



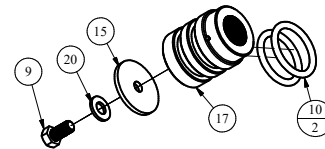
## OPTIONAL STRAIGHT INLET VALVE



## TOP CAP ASSEMBLY



## PLUNGER ASSEMBLY



DRAWN	SMS	5/15/2017
CHECKED	DCL	9/11/2017
MODIFIED	ADC	8/13/2024

SIZE	C
SCALE	1 / 4

DWG NO	#77
--------	-----

 KUPFERLE Since 1957	2511 NORTH 9TH ST. ST. LOUIS, MO 63102 1-800-231-3990
SHEET	REV
1 OF 1	0.3



# #78 CUT SHEET

(VERTICAL INLET, 2-1/2" NST OUTLET)

PARTS LIST				
ITEM	QTY	PART NUMBER	DESCRIPTION	NOTES
1	3.17	2P	2" STEEL PIPE	
2	1.09	3/4GAL	3/4" GALVANIZED PIPE	B,C
3	1	4B	SLOTTED TOP SCREW	
4	1	510	CONNECTING NUT	C
5	1	592-C	2-1/2" NST SIDE CAP	
6	1	595	PEAR RING, CHAIN, S-HOOK ASSEMBLY	A
7	1	601A	2-1/2" NST NOZZLE	
8	1	669	GASKET FOR NOZZLE	C
9	1	721	MAINGUARD PACKING NUT	
10	1	77C	SEAT RUBBER BOLT	
11	2	77D	PLUNGER O-RING	C
12	1	77F	NECK	C
13	1	77GA	TOP CAP	
14	1	77H	LOCKING COVER	C,S
15	1	77I	SEAT WASHER	C
16	1	77J	BRASS 2" STRAIGHT INLET VALVE	C
17	2	77K	TOP CAP BOLT	C
18	1	77L	PLUNGER	
19	1	77M	O-RING FOR SLOTTED SCREW	C
20	1	77MG	PACKING NUT GASKET	C
21	1	77W	WASHER FOR PLUNGER	
22	1	78A	2" NOZZLE COUPLING (45°)	C
23	1	95G	HOUSING O-RING	
24	1	A1	TOP CAP GASKET	C
25	2	A16	NOZZLE CAP GASKET	C

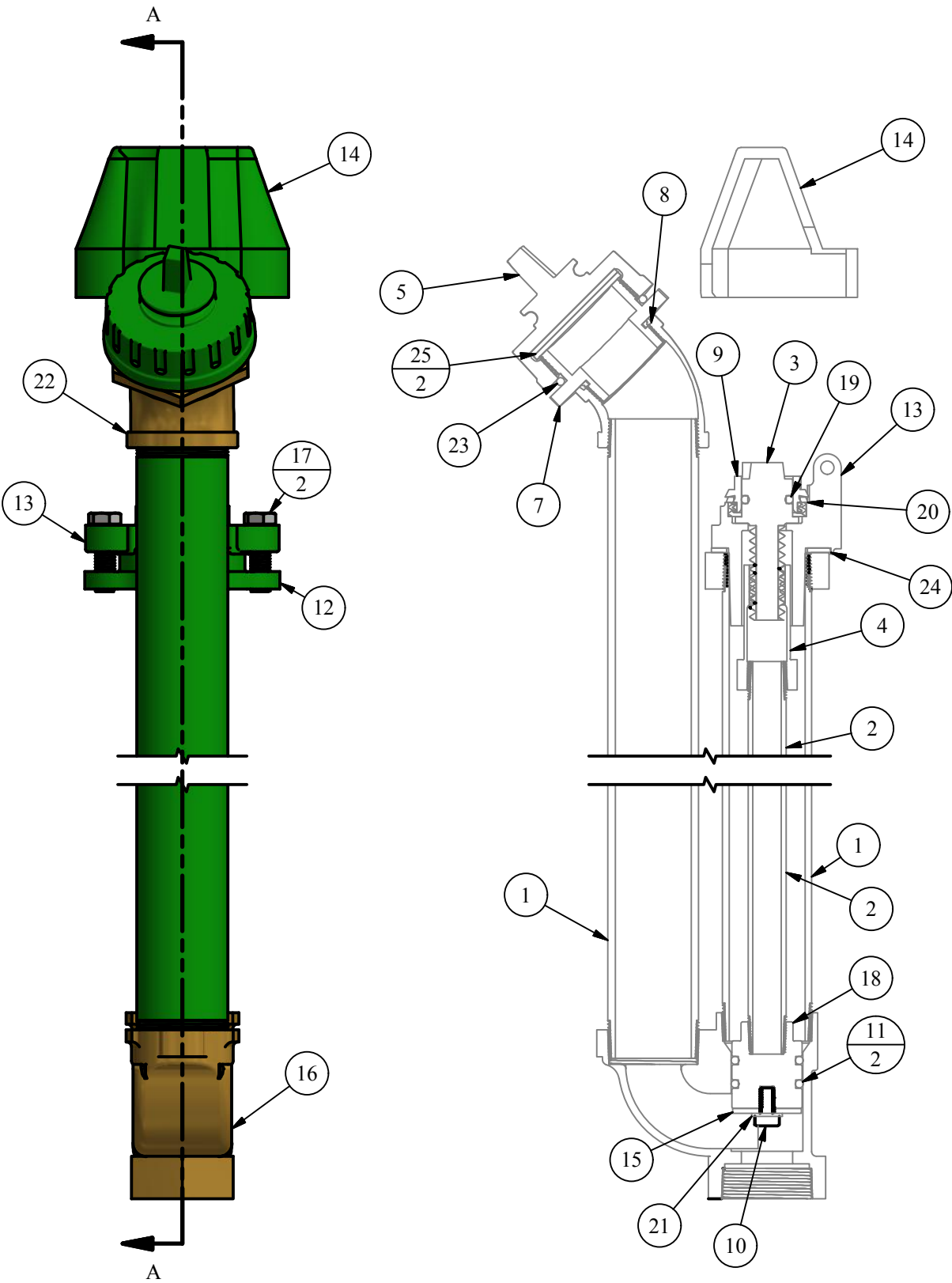
OPTIONS / REPAIR PARTS ONLY				
26	0	2MJG	2" MECHANICAL JOINT GLAND	
27	0	2TG	2" TRANSITION GLAND	
28	0	707	2" MJ ADAPTER	
29	0	77A	TRAFFIC BREAKAWAY COUPLING FOR VERTICAL OUTLET	A,C
30	0	77CL	IRON CLAMP	C
31	0	77P	BOLT FOR CLAMP	C
32	0	77Q	NUT FOR CLAMP	C
33	0	79V	BRASS 2" SIDE INLET VALVE	C
34	0	79W-IRON	IRON VALVE 2" MJ 90°	A
35	0	85LHW	LONG HANDLED WRENCH	A
36	0	CORTEN	MJ BOLT AND NUT	

OLD STYLE PARTS LIST				
37		4-77	"OLD STYLE" SQUARE TOP SCREW	A
38		4A	"OLD STYLE" SLOTTED TOP SCREW	A
39		620	"OLD STYLE" PACKING NUT	A
40		621	"OLD STYLE" PACKING NUT	C
41		77N	O-RING FOR TOP SCREW	A,C
42		77O	"OLD STYLE" PACKING NUT GASKET	A,C

REPAIR KITS			
PART NUMBER	DESCRIPTION	PARTS INCLUDED	NOTES
X4B	"NEW STYLE" SLOTTED TOP SCREW COMPLETE	4B SCREW (1), 77M O-RING (1)	DUE TO COMPATIBILITY, IT IS RECOMMENDED THAT X4B BE ORDERED WITH 510 - CONNECTING NUT
X592C	NOZZLE CAP COMPLETE 2-1/2" NST	592-C SIDE CAP (1), A-16 GASKET (2), 595 CHAIN ASSEMBLY (1)	
X601A	BRASS NOZZLE 2-1/2" NST	601A NOZZLE (1), 669 GASKET (1)	
X707	2" MJ ADAPTER	707 BRASS 2" MJ ADAPTER (1), 2MJG GLAND (1), 2TG 2" TRANSITION GASKET CORTEN MJ BOLT AND NUT (2)	
X721	"NEW STYLE" PACKING NUT WITH GASKET	721 PACKING NUT (1), 77MG GASKET (1)	SEE X77OPASSY
X77EXT-6	MAINGUARD EXTENSION - FIRST 6"	2P EXTERIOR PIPES (2), 3/4GAL OPERATING ROD (1), 3/4C COUPLING (1), 77A COUPLING (1), 77F NECK (2), 629A-B-SS BOLT (2), 827 GASKET (1)	
X77EXT-XX	MAINGUARD EXTENSION - EACH ADDITIONAL 6"	2P EXTERIOR PIPES (2), 3/4GAL OPERATING ROD (1), 3/4C COUPLING (1), 77A COUPLING (1), 77F NECK (2), 629A-B-SS BOLT (2), 827 GASKET (1)	
X77GA	TOP CAP COMPLETE	77GA TOP CAP (1), A1 GASKET (1), 77K BOLT (2)	SEE X77OPASSY
X77L	PLUNGER COMPLETE	77L PLUNGER (1),77D O-RING (2), 77I SEAT WASHER (1), 77W WASHER (1), 77C BOLT (1)	
X77OPASSY	77 OPERATING ASSEMBLY - GREEN (NOTE 4)	4B SCREW (1), 510 CONNECTING NUT (1), 721 PACKING NUT (1), 77MG GASKET (1), 77GA TOP CAP (1), A1 GASKET (1), 77K BOLT (2)	RECOMMENDED FOR ALL REPAIRS
X77RK	REPAIR KIT	77D O-RING (2), 77I SEAT WASHER (1), 77W WASHER (1)	

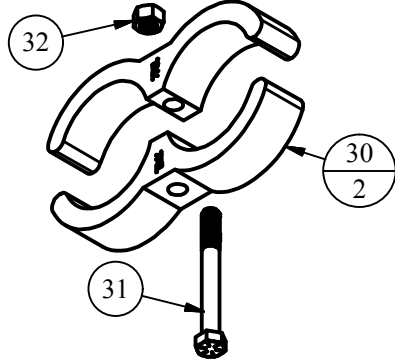
OLD STYLE REPAIR KITS			
X4	"OLD STYLE" PENT TOP SCREW COMPLETE	4 SCREW (1), 77N O-RING (1)	USED BEFORE APRIL 1995
X4A	"OLD STYLE" SLOTTED TOP SCREW COMPLETE	4A SCREW (1), 77M O-RING (1)	USED APRIL 1995 TO JANUARY 2012
X620	"OLD STYLE" PACKING NUT WITH GASKET	620 PACKING NUT (1), 77O GASKET (1)	USED BEFORE APRIL 1995
X621	BRASS PACKING NUT COMPLETE	621 PACKING NUT (1), 77MG GASKET (1)	USED APRIL 1995 TO JANUARY 2012
X77RK-OLD	"OLD STYLE" REPAIR KIT	77D O-RING (2), 77I-1/2 "OLD STYLE" SEAT WASHER (1), 77W WASHER (1)	USED BEFORE APRIL 1995

NOTE	DESCRIPTION
A	NOT SHOWN
B	PIPE LENGTH DEPENDENT ON DEPTH OF BURY
C	SOLD AS REPLACEMENT PART
S	SPECIFY COLOR ON ORDER

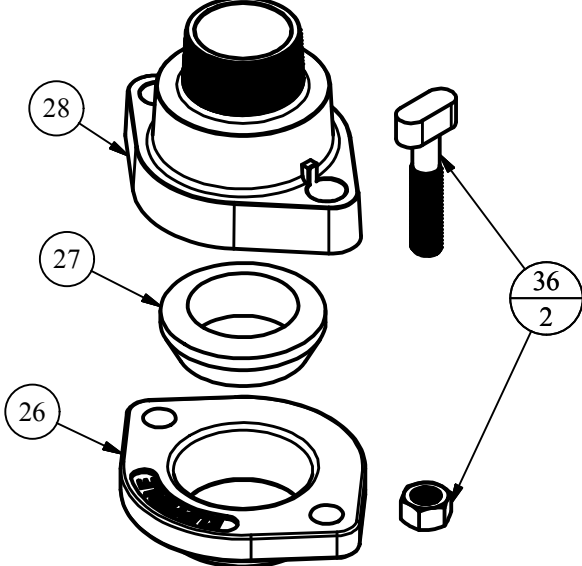


SECTION A-A  
CENTER SECTION VIEW

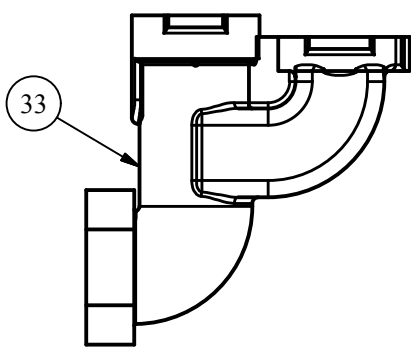
## OPTIONAL CLAMP ASSEMBLY (STANDARD ON D.O.B.'S OVER 5')



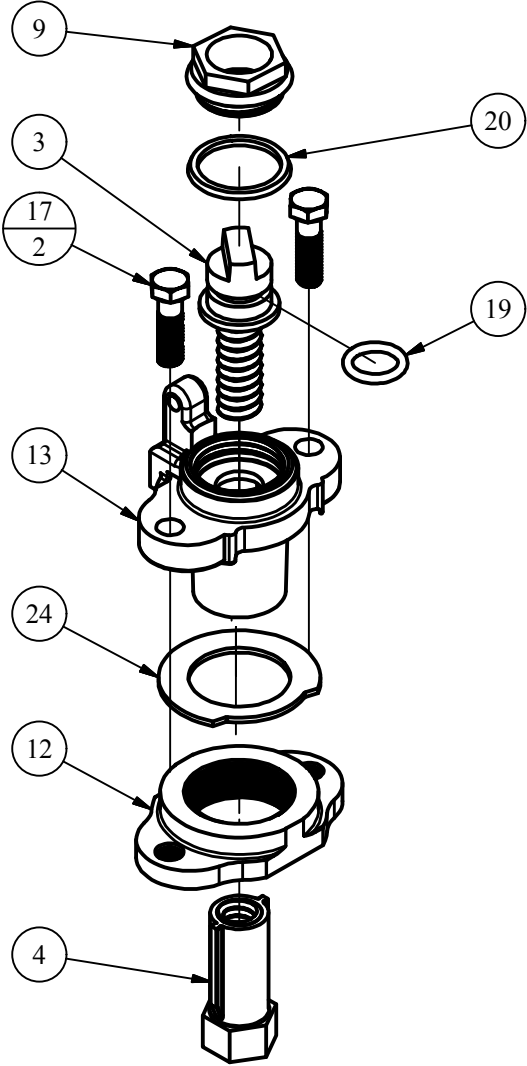
## OPTIONAL MJ ADAPTER



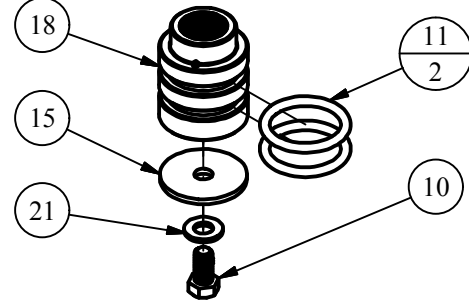
## OPTIONAL SIDE INLET VALVE



## TOP CAP ASSEMBLY




## PLUNGER ASSEMBLY



## LEGEND

- (X) → STANDARD TAG  
(X/Y) → TAG WITH Y QUANTITY

**DISCLAIMER**  
THIS DRAWING IS THE PROPERTY OF THE KUPFERLE  
FOUNDRY COMPANY. IT IS NOT TO BE USED OR  
DUPLICATED WITHOUT THE PERMISSION OF THE OWNER.

DRAWN SMS	11/14/2016	 2511 NORTH 9TH ST. ST. LOUIS, MO 63102 1-800-231-3990	
CHECKED DCL	9/10/2017		
MODIFIED			
SIZE C	SCALE 1 / 4		
DWG NO #78 Cut_Rev0	SHEET 1 OF 1		REV 0