## **Operating** Manual



Model 0.3% Model 0.3% HAC Model 2.5% Model 2.5% WSP Model 2.5% HAC Model 5% Model 5% HAC

Fluid Flow Range: 0.15 gpm to 30 gpm 34 lph to 6,800 lph

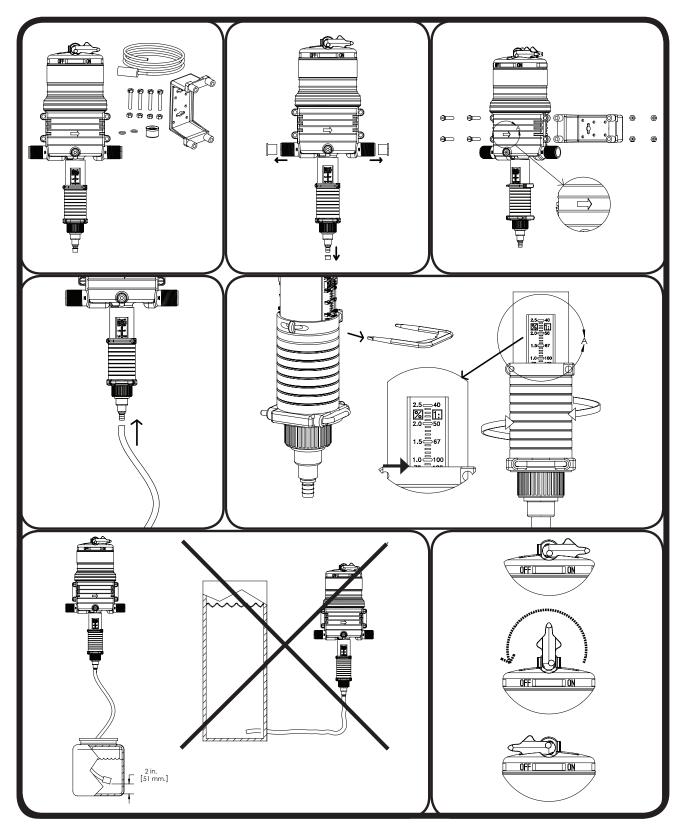
**Injection Range Dosage:** 0.025% to 5% 1:4000 to 1:20

**Operating Pressure:** 5 to 100 psi 0.34 to 6.9 bar

\*Specifications vary by model.



# Quick Start-up

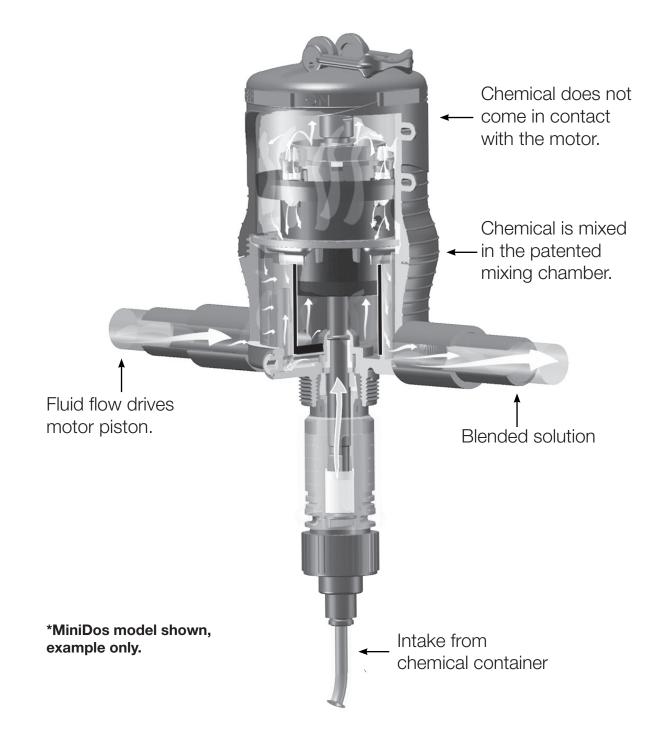




# **Operating** Principle

### Accurate and Reliable

Installed directly in the fluid supply line, the injector operates without electricity, using fluid (water) pressure as the power source. The fluid drives the injector, which pulls the required percentage of concentrate directly from the chemical solution container. Inside the Hydro patented mixing chamber, the concentrate is mixed with the fluid, and the fluid pressure forces the mixed solution downstream. The amount of concentrate will be directly proportional to the volume of fluid entering the injector, regardless of variations in flow or pressure.



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#### Please read this manual carefully before putting the Hydro injector into operation.

This booklet has the information you will need for the use and care of your new Hydro injector. If you have any further questions about your injector, the warranty, routine maintenance or proper usage, please contact your nearest distributor or Hydro Systems customer service.

These models are designed to inject liquid concentrate or soluble powder that are recommended and approved for injection into fluid systems.

It is the responsibility of the operator to determine the correct dosage settings of the unit using the chemical manufacturers' recommendation for dispensing their product, and to assure that proper dosage is being maintained.

#### Maintenance and Warranty

Hydro offers a three year limited warranty from the original date of purchase for manufacturing or materials defects only. With proper use and care, your injector should provide you long-term performance.

<b>For Your Records</b> The serial number of your Hydro injector is located on the injector body. Please record this number in the space below and reference it when calling your distributor or Hydro for information, parts and service.	
Serial #	
Date Purchased	

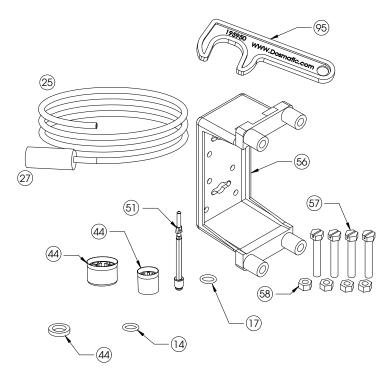
This document does not form a contractual engagement on the part of Hydro Systems Company and is for information only. Hydro reserves the right to alter product specifications or appearance without prior notice.

# Package Contents

### The injector is packaged with the following items:

- Injector (not shown)
- Dosage Piston
- O-ring
- Manual (not shown)

- Mounting Bracket
- Mounting Nuts and Bolts
- Filter
- Suction Tube



Model	NPT	BSP
0.3%	113229R	113729R
0.3% HAC	113229HAC	113729HAC
2.5%	113209	113709
2.5% WSP	113209WSP	113709WSP
5%	113210	113710
2.5% HAC	113209HAC	003709HAC
5% HAC	113210HAC	113710HAC

### Specifications



#### SuperDos 30 gpm (100 max. psi)

Model 0.3%	0.025% - 0.3% (1:4000 -1:333)
Model 2.5%	0.2% - 2.5% (1:500 -1:40)
Model 2.5% WSP	0.3% - 2.5% (1:300 -1:40)
Model 5%*	0.4% - 5% (1:250 -1:20)
Flow Rate:	. 0.15 - 30 gpm** (34 - 6,800 lph)
Operating Pressure: .	. 5 - 100 psi (0.34 - 6.9 bar)
Dina Coupling	1" NDT/DOD

Housing	Proprietary Engineered Composite Material
Avg. Dosing Accuracy	+/- 5% of ratio
Repeatability	+/- 3% of ratio
Maximum Temp.	100°F (38°C)
Minimum Temp.	34°F (1°C)
Maximum vertical suction of concentrate	13 Feet (3.6 Meter)
Maximum horizontal suction of concentrate	49 Feet (15 Meter)
Self-Priming	Yes
Seal Material Available: *Contact your distributor for specific chemical information	Aflas - Alkaline concentrates Viton - Acids, oils & pesticides EPDM - Alkaline concentrates Kalrez

# Safety Precautions/Warranty Compliance



**Warning:** Please read precautions thoroughly before operation. Must meet all applicable local codes and regulations.

#### **Remove Red Caps Prior to Installation**

Your injector is 100% factory tested before delivery and may contain a small amount of water. The three red plastic caps are fitted after testing to ensure cleanliness of the injector.

#### **Before Applying Aggressive Chemicals**

Please consult your distributor, chemical manufacturer or contact Hydro's customer service to confirm compatibility with your injector. Always wear proper safety protection as recommended by chemical supplier.

#### Label all Fluid Lines, Valves and Connections

If the solution that is being injected is not suitable for drinking, all fluid lines should be labelled: *Warning - not for human consumption!* 

#### **Monitor Outlet Flow**

It is the user's responsibility to monitor the output of chemical injected.

#### A Filter is Recommended and Required

Install a filter of 140 mesh (104 micron) or finer depending on your fluid quality to prolong the working life of the injector and for the warranty to be valid. A filter is imperative since most fluid contains impurities or particles, especially if the fluid source comes from a well, pond or lake.

#### Avoid a Potentially Hazardous Chemical Accident

Select a safe location. Chemical container should be kept away from children and/or high usage areas and the location must also not be susceptible to freezing temperatures.

#### **Avoid Solution Contamination**

Use only clean FILTERED fluid. Do not allow contaminants to enter the solution container. They can be pumped into the fluid line and may cause the spread of disease. Dirt, debris and other contaminants in the solution container may cause excessive wear to the unit.

#### **Fluid Temperature**

Min: 34°F (1°C), Max: 100°F (38°C)

#### **Maximum Fluid Pressure**

100 psi (6.9 bar). Operating pressure and flow are reduced while using remote injection kit. Install a pressure regulator and/or pressure relief valve to ensure operating pressure does not exceed the maximum specification.

#### Before Removing An Injector From The System

Release fluid pressure. While the system is in operation, turn off the incoming fluid valve. Leave the out going valve open. This will relieve the pressure at the injector and all parts of the system after the injector. Injector is now safe to remove.

### General Tips

Please read this instruction manual thoroughly. Following the procedures, will increase the life of your injector.

#### For A Long Service Life

Start with clean fluid by using an inline filter to reduce impurities. Keep the solution container covered and clean. Keep the suction tube filter 2" (5 cm) from the bottom of the container. Perform maintenance procedures as recommended (see Maintenance page 10).

#### Soluble Powder Use

Ensure the chemical is completely dissolved before starting the injector. If necessary, dissolve the chemical in hot water and allow to cool before using. Failure to thoroughly dissolve the chemical will cause premature wear to the dosage piston and the inner cylinder.

#### **Keep From Extreme Temperature**

Protect the injector from freezing temperatures or excessive heat.

#### **Rinse Injector After Each Use**

Additive allowed to remain in injector can dry out, foul or damage the lower end at the next start-up (see Maintenance page 10).

#### Injector Not in Use for an Extended Period

If the injector has not been stored properly deposits may have dried onto the motor (see Maintenance page 10). Before operation, soak entire unit into room temperature water approx. 72°F (22°C) for an eight hour period.

# Operations

#### **Clicking Sound is Normal**

Fluid flowing through the injector will automatically cause the injector to "click" and inject a set amount of solution into the fluid line. The higher the flow rate the more frequent the "clicking". The injector is designed to inject solution proportionally (at the same set ratio) regardless of fluid flow.

#### Service Fluid Flow

Fluid flow and pressure must be within the established specifications (see Specification on page 6) for your model.

### Change Feed (Injection) Rate

The feed rate on the injector is adjustable EVEN WHILE OPERATING AND UNDER PRESSURE. To change feed rate see (Fig. 1 and Fig. 2).

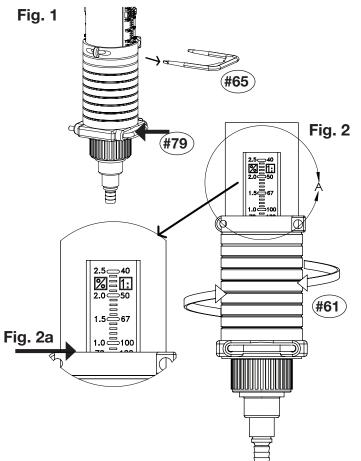
\* Do not remove #79 when injector is under pressure.

1. Remove Upper Interlock Pin (#65) (Fig. 1).

2. Rotate Ratio Adjuster Sleeve (#61) up or down to the desired setting (Fig. 2). Use the top of the Ratio Adjuster Sleeve to line up with the desired feed rate on the setting (Fig. 2a).

3. Re-insert Upper Interlock Pin (#65). Clip must be parallel with settings to be able to re-insert.

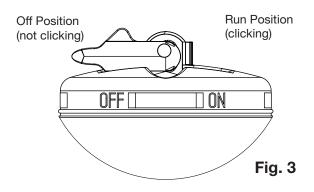
NOTE: Do not screw Ratio Adjuster Sleeve below lowest setting line. Measure outlet fluid to assure desired feed rate is being delivered.

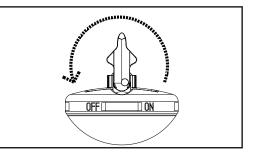


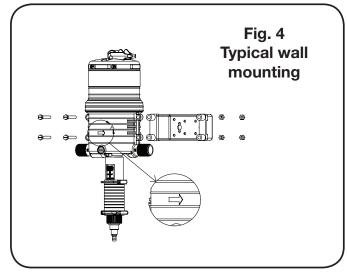
### **Bypass Operation**

Injecting solution into the fluid line can be TEMPORARILY stopped with the On/Off feature (Fig. 3). Moving the On/Off Lever to the OFF position allows service fluid to pass through the injector without injecting chemical. No "clicking" will be heard.

With the On/Off lever set to the ON position the injector will operate as normal and "clicking" will be heard when fluid is flowing. It is recommended to use the three-valve bypass (see Fig. 5), for continued bypassing or servicing of the injector.







# Installation & Start-Up Refer to Fig. 4 and Fig. 5

#### Fluid Filter (Required)

Install a filter of 140 mesh (104 micron) or finer depending on your fluid quality to prolong the working life of the injector and for the warranty to be valid. Hydro recommends a Twist II Clean® filter that can be ordered with your injector.

#### **Mounting Injector**

Securely fasten your injector to a solid object such as a wall or in a cold fluid line. Note arrow on injector indicates fluid flow.

#### **Backflow Preventor (Recommended)**

Install one that meets local code requirements.

#### **Pressure Safety Release Device (Recommended)**

Prevents pressure from exceeding specifications of the unit.

#### Bypass Valve Set-up (Recommended)

Allows the injector to be taken off-line for maintenance or storage when not in use.

#### Fluid-Hammer Arrester (Recommended)

Prevents fluid-hammer damage to the injector when operating guick closing solenoid, pneumatic or hand-operated ball valves on the fluid system.

#### Anti-Siphon Valve (Optional)

To prevent solution from being siphoned out (from the solution container) into the feed lines when the upstream valve is shut off. The anti-siphon valve must be installed on the downstream outlet.

#### **Additional Siphoning Prevention**

Place solution container on a level below the injector suction tube fitting. Using the inlet side as a shut-off valve could cause full strength solution to siphon into the feed line.

#### **Solution Container**

Use any size container. A lid or cover is recommended. To connect your solution container, gently push the end of the suction tube onto the bottom of the suction tube fitting assembly. Place the filter into the solution container at least 2" (5 cm) from the bottom and fill with at least 2" (5 cm) of chemical solution.

#### **Never Use Petroleum Based Lubricants**

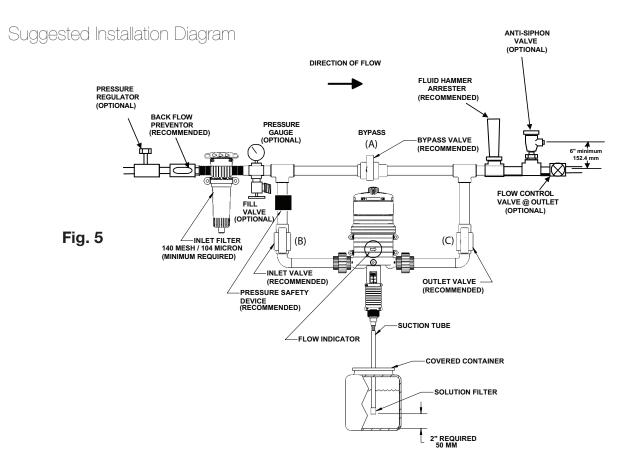
The injector is shipped with a thin coat of silicone around the seals for ease-of-assembly. Petroleum based lubricants such as Vaseline<sup>®</sup>, baby oil, WD40<sup>®</sup>, or motor oil on the O-rings or any part of the injector should never be used as this can cause particles to adhere and clog or damage the injector.



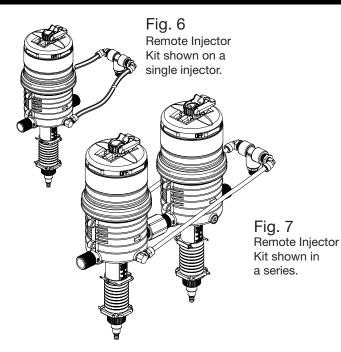
Check System for Leaks and Start-Up Procedures

Open the bypass valve (A), close inlet valve (B) and outlet valve (C) to prevent fluid flow into the injector. SLOWLY turn on the main fluid line. Run fluid flows between 5 - 12 gpm (11-45 l/m) through the plumbing system. Turn on all of the valves located downstream from your injector to release trapped

air. SLOWLY turn on the inlet valve (B). Open the outlet valve (C) and close valve (A). As fluid travels through the injector, you will hear a "clicking" sound. Check for leaks and correct if necessary.



## **Remote** Injecting



### Remote Injector Kit (not included)

Is recommended for the following:

Kit Part Numbers 012705

#### Single Injector:

To prevent mineral buildup within the body of the unit. Use when injecting chemicals that cause minerals to precipitate from fluid (see Fig. 6)

#### Injectors In a Series:

When injecting multiple chemical injections, using two or more injectors. Each injector adds chemical to the fluid(water) system, while bypassing the next injector and eliminating the potential damage to that injector (see Fig. 7).

NOTE: when mixing more than one chemical, always refer to your chemical manufacturer information guide for proper application. Contact your local distributor or Hydro customer service for information or to order.

### Maintenance

#### Reference numbers refer to pages 13 - 18

#### **Rinse Injector After Each Use**

Additive allowed to remain in injector can dry, foul or damage the lower end at the next start-up. Place suction tube into a 1 qt. (0.95 liters) or more container of fresh filtered water. Flow fresh water through the injector by operating until container is empty. This procedure is not needed for continuous operation.

#### **Clean Solution Container**

Keep covered to prevent dirt, flies and flying debris from entering the container. Rinse container thoroughly and often. Do not mix chemicals together that might react and cause a precipitate. Use FILTERED fluid when filling container.

#### **Clean Suction Tube Filter Screen**

Inspect each time new solution is added. Clean filter screen (#27) and suction tube (#25) as necessary by rinsing in fresh water. Replace if necessary. Keep filter screen off bottom of solution container to prevent dirt and precipitate from clogging filter.

#### **Clean Inlet Filter**

Clean or replace inlet filter as required to increase the life of the unit as well as reduce pressure loss.

#### Bypass Injector

When not in use place the injector in bypass mode by using the three valve bypass (preferred) or turn the on/off lever on the top of the injector to the off position.

#### Storage

For extended storage, rinse injector (see "Rinse Injector After Each Use") and place underwater in a container. Apply monthly, <0.1 oz. (29 ml) of chlorine bleach to avoid algae growth. KEEP FROM FREEZING. Perform these maintenance procedures to extend the life of your unit.

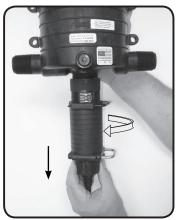
#### Refer to page 14 - 15 SuperDos 30 (0.3%) Models

Every 3 - 6 Months	Every 6 - 12 months	Replace as necessary
<ol> <li>Clean seal areas (# 17 &amp; 13).</li> <li>Check #17 O-ring, #68 Cylinder, clean and/or replace as necessary.</li> </ol>	<ol> <li>Replace #17 O-ring and #51 Lower Shaft Assy.</li> <li>Clean and/or replace #13 Check Poppet, #11 Suction Tube Fitting.</li> </ol>	1. #68 Cylinder 2. #51 Lower Shaft Assembly

#### Refer to page 16, 17 & 18 SuperDos 30 (2.5%), (5%) Models

Every 3 - 6 Months	Every 6 - 12 months	Replace as necessary
1. Clean seal areas (# 13 & 14, #44 - WSP). 2. Check #17 O-ring, #7 Cylinder, clean and/ or replace as necessary.	1. Replace #17 O-ring and #44 Dosage piston/ gasket (WSP model). Clean and/or replace. 2. #13 Check Poppet, #11 Suction Tube Fitting.	1. #7 Cylinder 2. #14 (#44 - WSP) O-ring

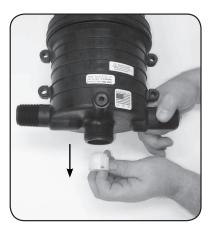
## **Routine Maintenance** Instructions



Step 1. Unscrew LOWER END CYLINDER ASSEMBLY from body. Remove LOWER END CYLINDER ASSEMBLY



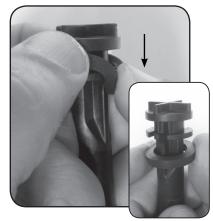
Step 2. Rotate #51 SHAFT 90° and pull from body.



Step 3. Pry the #15 SEAL RETAINER from the injector. Pry #17 O-ring from the unit. NOTE: O-ring may still be seated at the base of the unit.



Step 4. For 2.5% & 5% Replace #44 DOSAGE PISTON flared-end up and #14 O-ring.



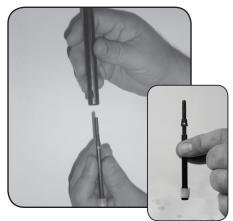
Step 4a. For 2.5% WSP Pinch and pull #44 DOSAGE GASKET over the retainer lip. Slide off the #51 shaft assembly.



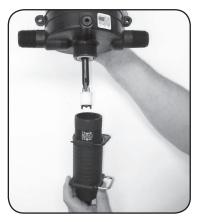
Step 5. Reinsert #15 SEAL RETAINER and #17 O-ring onto # 51 SHAFT ASSEMBLY.



Step 6. Reinsert #51 SHAFT ASSEMBLY into body and rotate 90° to lock. Confirm the shaft is locked in by gently tugging on the shaft. Shaft should remain inserted.



Step 4b. For 0.03%. Replace LOWER SHAFT assembly into upper shaft.



Step 7. Screw LOWER END CYLINDER ASSEMBLY onto body. Ensure #16 gasket is seated on the top of cylinder assembly.

## **Troubleshooting**

### New Install - Always Pressure Up Slowly (Follow start up on page 9)

Problem	Cause	Solution
	Fluid not flowing through unit	Are the red plugs at the inlet, outlet and suction tube fitting openings removed?
		Is the unit installed backward? The arrow on the unit must point in the direction of the fluid flow.
		If still not clicking, do not open the upper body. Call Hydro Customer Service.
No Clicking		Fluid rate is below or exceeds rated service flow of injector. (see Specifications page 6).
Sound	Fluid flowing through unit	Has the new injector been stored for an extended period? If so, submerge the injector in room temperature fluid for 24 hours so that the working parts can reabsorb fluid and swell back to the proper size.
		Operating pressure exceeds maximum limit. Install a pressure reducer valve. (see Specifications page 6).
		On/Off Lever in off position. Place the On/Off lever switch to the ON position. By-pass valve (A) not closed. Check and set valve to the CLOSED position.

### Injector in Operation or After Scheduled Maintenance

Problem	Cause	Solution
	Main Piston Assembly #9 worn	Replace # 9 Main Piston Assembly. Clean fluid filter.
	Cover #1 or main body #40 worn or scored	Install or clean fluid filter.
No Clicking	On/Off Lever in off position	Place the On/Off lever switch to the ON position.
Sound	By-pass valve (A) open	Set Valve (A) to the closed position.
	Dirty or plugged inlet filter	Ensure mesh size is correct for proper filtration. Clean filter.
	#17 Worn or not seated properly	Re-seat #17 or replace.
	Cylinders #7 or #68 worn	Replace.
	Dosage piston/gasket (WSP model) #44 (0.3% model #51) worn or installed incorrectly	Replace. Ensure during maintenance replacement that #44 dosage piston was installed correctly flared-end up.
	O-ring retainer #15 installed incorrectly	Install correctly.
Clicking Sound No Suction Of Solution	O-ring seat #14 or dosage piston/ gasket (WSP model) #44 (0.3% model #51) damaged	Replace.
	#17 O-ring worn and/or loose	Replace.
	Suction tube #25 or suction tube fitting #11 cracked, leaking or clogged suction tube filter	Replace and/or clean as necessary.
	Check valve #13 leaking	Clean & replace as necessary.
	#44 (0.3% model #51) Dosage Piston/ Gasket (WSP model) worn	Replace.
	#7 (#68 - 0.3%) Inner Cylinder worn	Replace.
Clicking Sound. Under Injecting	Unit operates at high-flow and not at low flow	Replace #17 O-ring.
	Main Piston Assembly #9 worn	Replace # 9 Main Piston Assembly. Clean fluid filter.
	Cover #1 or main body #40 worn or scored	Install or clean fluid filter.
Fluid De filling	Check valve #13 leaking	Check seat area on suction tube fitting #11. Check valve and seal must fit loose in the suction tube fitting. Clean seal and inside fitting for debris.
Re-filling Solution Tank	Washer seal on #13 is swollen or chemical attack	Replace with new check valve assembly.

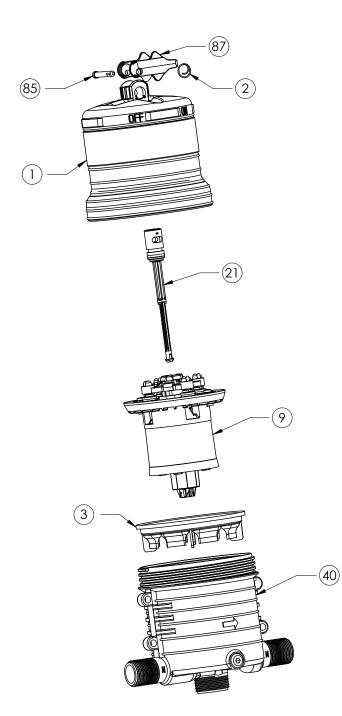
## Kits & Spare Parts List

Injector Repair Parts	14
0.3% HAC:	
0.3%:	
2.5%:	
2.5% WSP:	
5%:	
Accessories:	

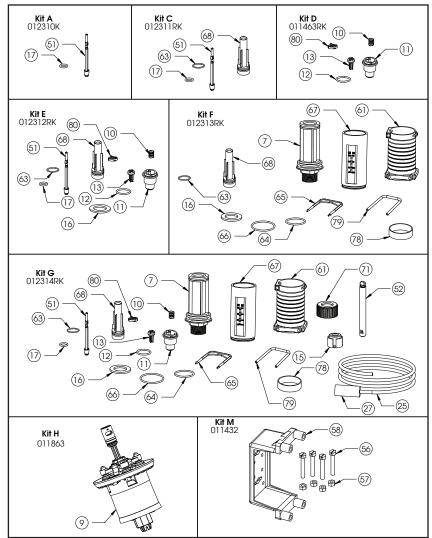


# Injector Repair Parts

Ref. #	Description
1	Upper Body
2	Cotter Ring
3	Mixing Chamber Gasket
9	Piston Assembly
21	Shaft Assembly
40	Lower Body NPT 1"
	Lower Body BSP 1"
85	Upper Shaft Pin
87	On/Off Handle



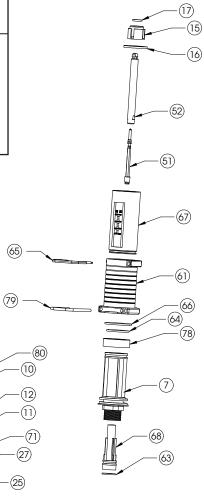
## **0.3%** HAC



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Lower End Assembly

Manual Reference	Description of Part
7	Cylinder, inner
10	Spring
11	Suction tube fitting
12	O-ring
13	Check poppet
15	Seal retainer, O-ring
16	Lower end gasket
17	O-ring
25	Suction tube, 1/4" ID x 5 ft
27	Compression fitting
51	Lower shaft assembly
52	Upper shaft
61	Ratio adjustment sleeve
63	O-ring, inner cylinder
64	O-ring, inner cylinder, lower end
65	Interlock pin
66	O-ring, outer cylinder, lower end
67	Cylinder, outer
68	Cylinder, inner for #7
71	Nut, suction tube fitting
78	Lower end stop
79	Retainer clip, bottom
80	Twistlock



C.F.

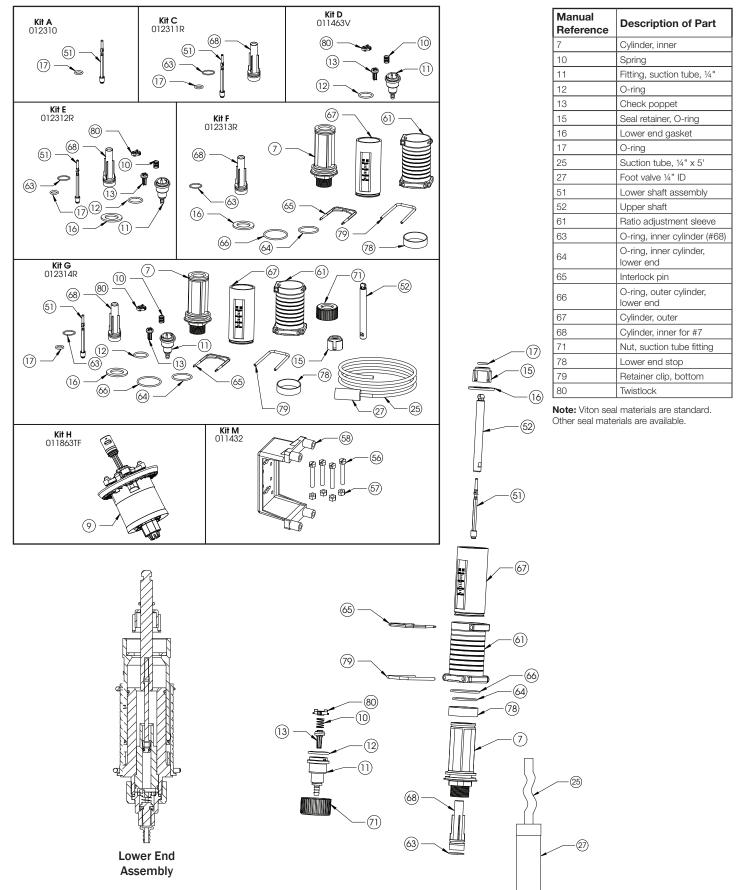
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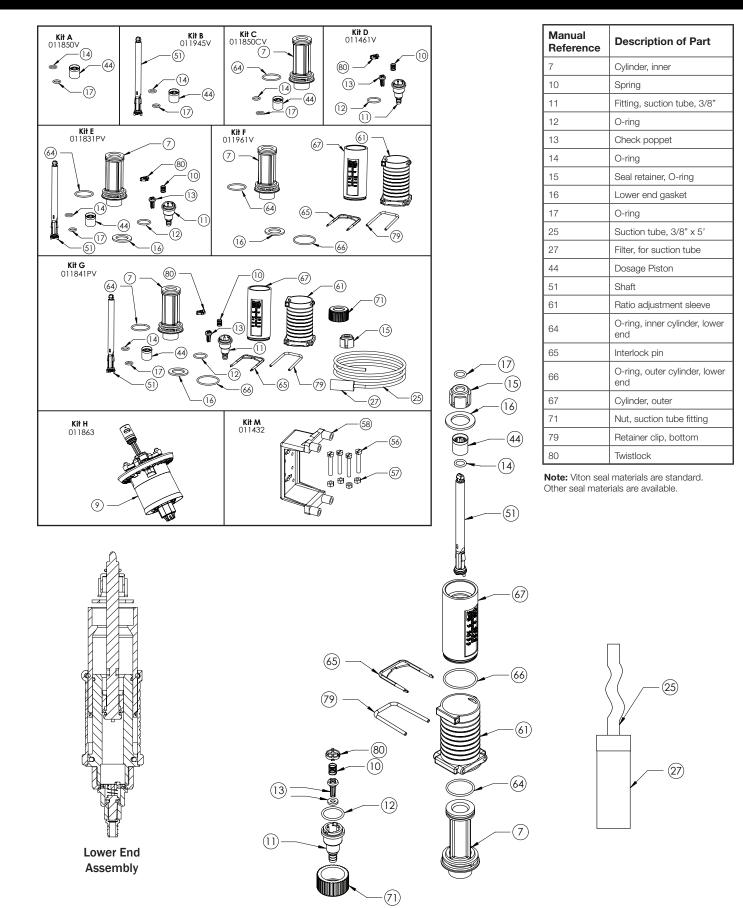
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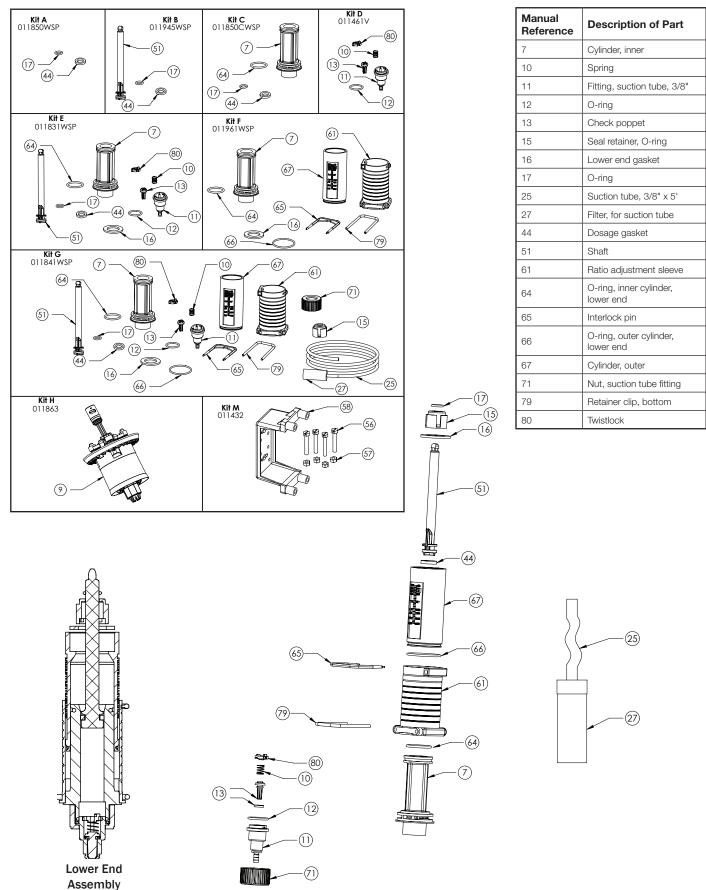
## 0.3%

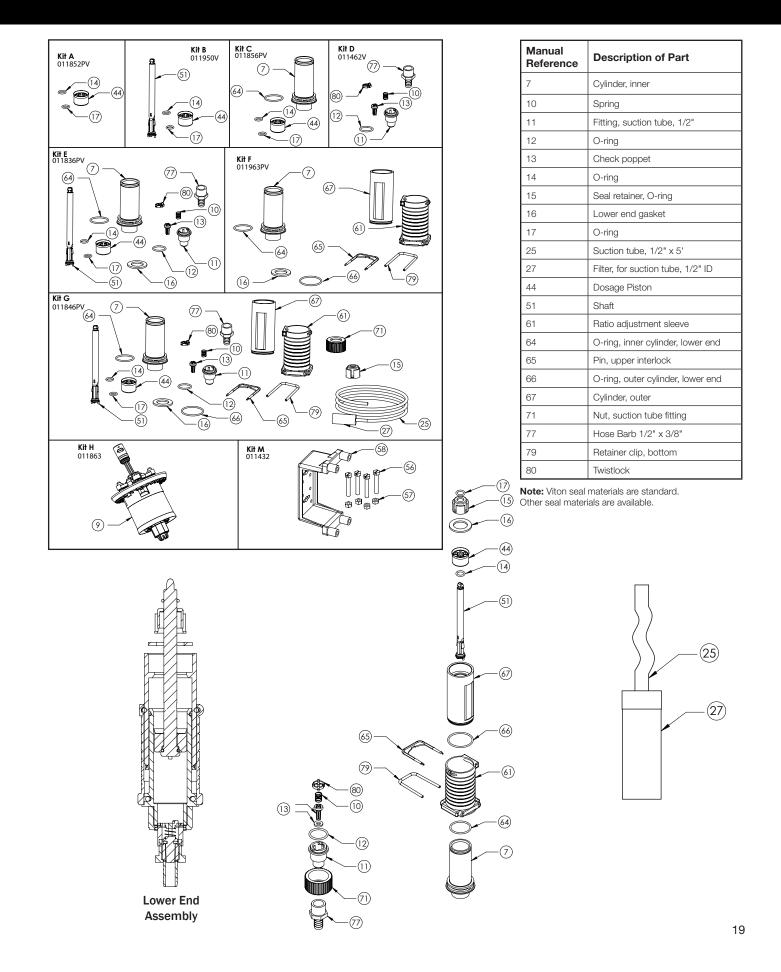


## 2.5%



## 2.5% WSP





## Accessories



#### Twist II Clean Inline Filter®

#### Available In:

3/4" - 25 gpm (95 l/mn) 100 psi (7 bar) 1" - 39 gpm (114 l/mn) 100 psi (7 bar) 1.5" - 78 gpm (295 l/mn) 100 psi (7 bar) 2" - 150 gpm (568 l/mn) 100 psi (7 bar) \* Various mesh sizes available.







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