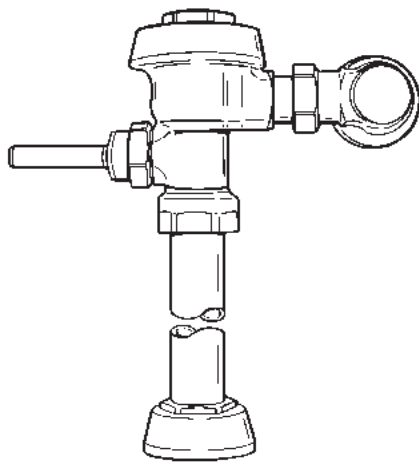


SLOAN®

Royal® Flushometer

INSTALLATION INSTRUCTIONS FOR STANDARD EXPOSED WATER CLOSETS AND URINALS

NEW! Now featuring Sloan's exclusive
Dual Filtered Diaphragm™

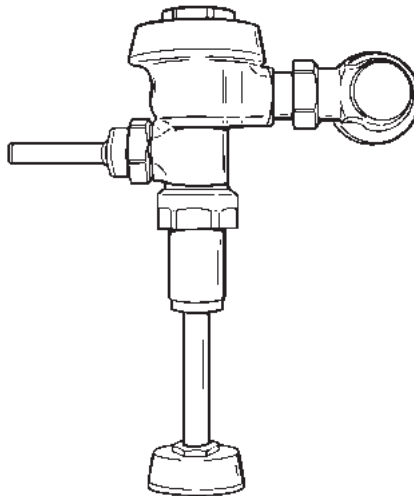


Exposed Closet Flushometer for 1-1/2" Top Spud

- MODEL 110/111
- MODEL 113
- MODEL 115
- MODEL 116

Exposed Service Sink Flushometer for 1-1/2" Top Spud

- MODEL 117



Exposed Urinal Flushometer for 1-1/4" Top Spud

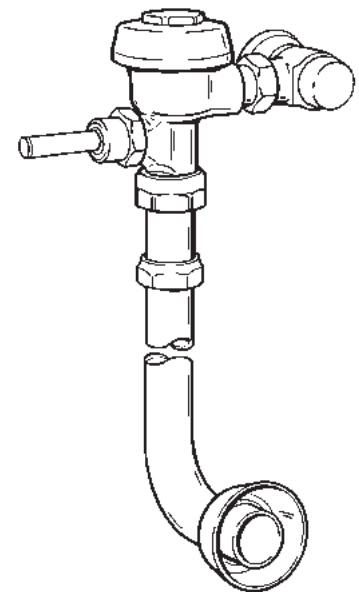
- MODEL 180

Exposed Urinal Flushometer for 3/4" Top Spud

- MODEL 186



Made in the U.S.A.



Exposed Closet Flushometer for 1-1/2" Back Spud

- MODEL 120
- MODEL 121
- MODEL 122

Installation of the Sloan Royal® Flushometer provides the quality, long life and water economy that makes Sloan Flushometers the most dependable ever. Sloan Flushometers provide outstanding water saving capabilities by precisely metering every flush. Royal Flushometers have been engineered to deliver a consistent, quiet flush, time after time. No internal adjustment of the Flushometer is required. Patented features provide unequalled performance on today's new generation of low consumption fixtures.

Royal Flushometers are designed for easy installation and maintenance and

come complete with a metal oscillating ADA compliant Non-Hold-Open lever actuator, Bak-Chek® control stop with vandal resistant stop cap, adjustable tailpiece, vacuum breaker flush connection, spud coupling, sweat solder adapter kit, and wall and spud flanges.

The following instructions will serve as a guide when installing the Sloan Flushometer. As always, good safety practices and care are recommended when installing your new Flushometer. If further assistance is required, contact your nearest Sloan Representative office.

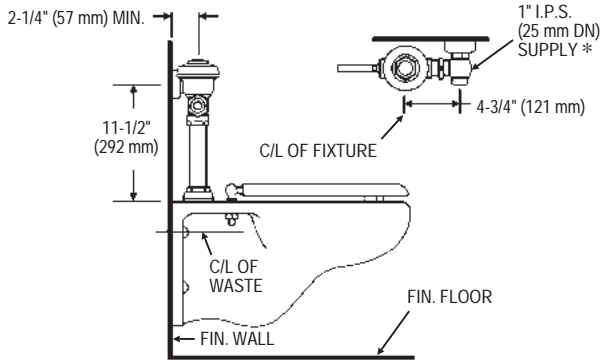
LIMITED WARRANTY

Sloan Valve Company warrants its Royal Flushometers to be made of first class materials, free from defects of material or workmanship under normal use and to perform the service for which they are intended in a thoroughly reliable and efficient manner when properly installed and serviced, for a period of three years (1 year for special finishes) from date of purchase. During this period, Sloan Valve Company will, at its option, repair or replace any part or parts which prove to be thus defective if returned to Sloan Valve Company, at customer's cost, and this shall be the sole remedy available under this warranty. No claims will be allowed for labor, transportation or other incidental costs. This warranty extends only to persons or organizations who purchase Sloan Valve Company's products directly from Sloan Valve Company for purpose of resale.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE HEREOF. IN NO EVENT IS SLOAN VALVE COMPANY RESPONSIBLE FOR ANY CONSEQUENTIAL DAMAGES OF ANY MEASURE WHATSOEVER.

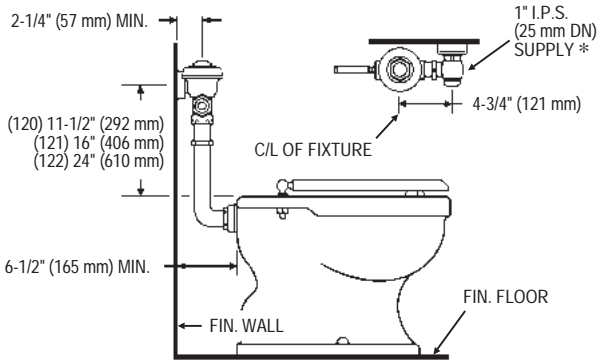
VALVE ROUGH-IN — Figure A

MODEL 110 — Water Saver, 3.5 gpf (13.2 Lpf)
MODEL 111 — Low Consumption, 1.6 gpf (6.0 Lpf)



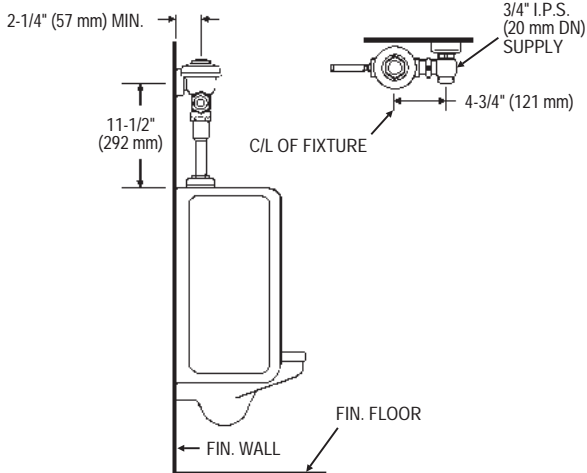
* 1" CONTROL STOP IS AVAILABLE WITH WHITWORTH THREAD

MODEL 120, 121 & 122 — Water Saver, 3.5 gpf (13.2 Lpf)
MODEL 120-1.6, 121-1.6 & 122-1.6 — Low Consumption, 1.6 gpf (6.0 Lpf)

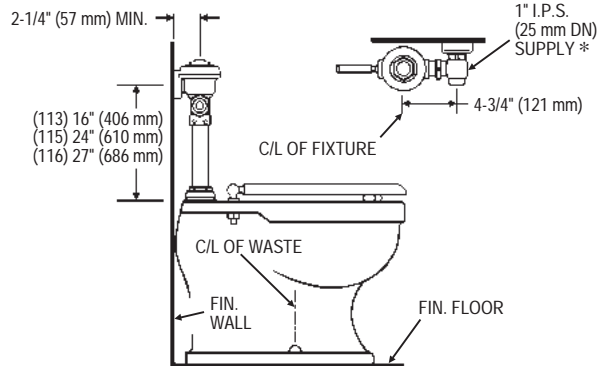


* 1" CONTROL STOP IS AVAILABLE WITH WHITWORTH THREAD

MODEL 186 — Water Saver, 1.5 gpf (5.7 Lpf)
MODEL 186-1 — Low Consumption, 1 gpf (3.8 Lpf)
MODEL 186-0.5 — 0.5 gpf (1.9 Lpf)

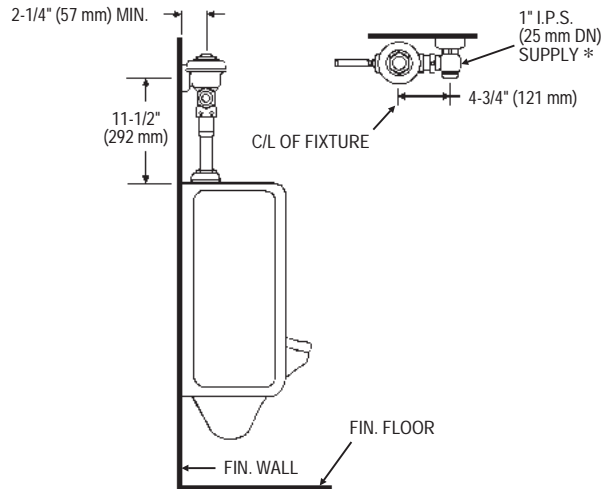


MODEL 113, 115 & 116 — Water Saver, 3.5 gpf (13.2 Lpf)
MODEL 113-1.6, 115-1.6 & 116-1.6 — Low Consumption, 1.6 gpf (6.0 Lpf)



* 1" CONTROL STOP IS AVAILABLE WITH WHITWORTH THREAD

MODEL 180 — Standard, 3.5 gpf (13.2 Lpf)
MODEL 180-1.5 — Water Saver, 1.5 gpf (5.7 Lpf)
MODEL 180-1 — Low Consumption, 1 gpf (3.8 Lpf)



* 1" CONTROL STOP IS AVAILABLE WITH WHITWORTH THREAD

MODEL 117 — Standard, 6.5 gpf (24.6 Lpf)

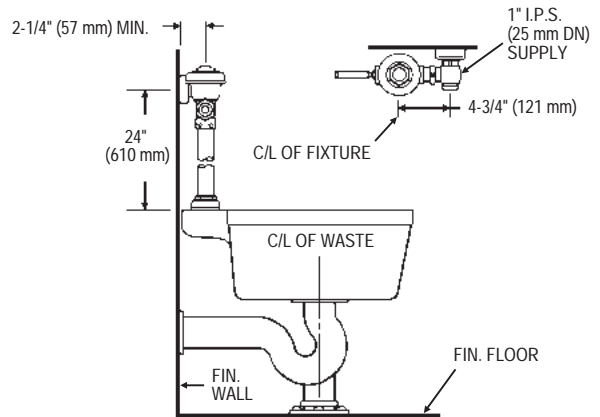


Figure A

NOTE: Water Closet Valves with "-2.4" Model Designation Deliver 2.4 gpf (9.0 Lpf)

PRIOR TO INSTALLATION

Before you install the Sloan Flushometer, be sure the items listed below are installed (see Figure A).

- Closet/urinal fixture
- Drain line
- Water supply line

Important:

- **ALL PLUMBING SHOULD BE INSTALLED IN ACCORDANCE WITH APPLICABLE CODES AND REGULATIONS.**
- **WATER SUPPLY LINES MUST BE SIZED TO PROVIDE AN ADEQUATE VOLUME OF WATER FOR EACH FIXTURE.**
- **FLUSH ALL WATER LINES PRIOR TO MAKING CONNECTIONS.**

The Sloan ROYAL® is designed to operate with 10 to 100 psi (69 to 689 kPa) of water pressure. THE MINIMUM PRESSURE REQUIRED TO THE VALVE IS DETERMINED BY THE TYPE OF FIXTURE SELECTED. Consult fixture manufacturer for minimum pressure requirements.

Most Low Consumption water closets (1.6 gpf/6 Lpf) require a minimum flowing pressure of 25 psi (172 kPa).

TOOLS REQUIRED FOR INSTALLATION

- Slotted screwdriver
- Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench

INSTALLATION

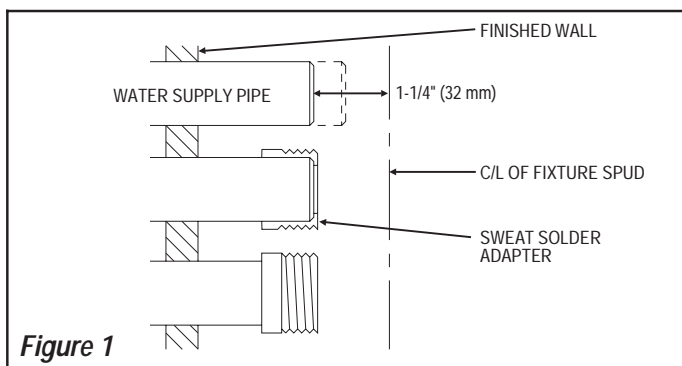
If an existing Control Stop is being used in this installation, skip ahead to Step 4 for Vacuum Breaker installation.

Step 1 — Install Optional Sweat Solder Adapter (Figure 1)

Install the Sweat Solder Adapter only if your supply pipe does not have threaded ends. If your installation includes a supply line with a threaded iron pipe nipple, skip ahead to Step 2.

Measure distance from finished wall to centerline of Fixture Spud. Cut water supply pipe 1-1/4" (32 mm) shorter than this measurement. Chamfer O.D. and I.D. of water supply pipe.

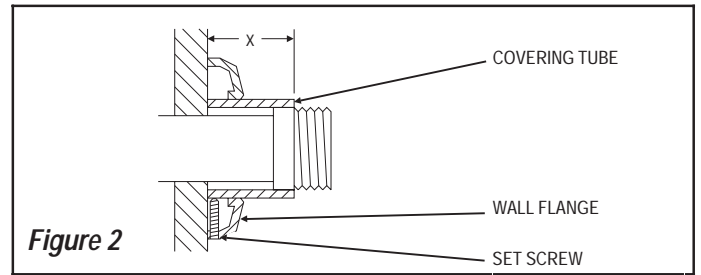
Slide Sweat Solder Adapter onto water supply pipe until end of pipe rests against shoulder of Adapter. Sweat solder Adapter to water supply pipe.



Step 2 — Install Wall Flange and Covering Tube (Figure 2)

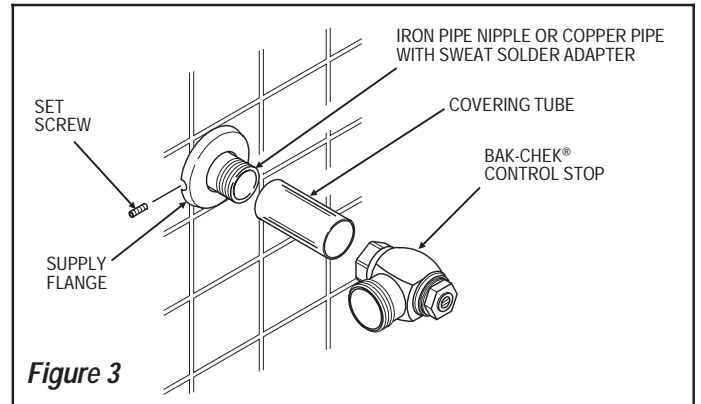
Determine length of Covering Tube by measuring distance from finished wall to the first thread of Adapter (dimension "X" in Figure 2). Cut Covering Tube to this length.

Slide Covering Tube onto water supply pipe. Slide Wall Flange over Covering Tube until it rests against the finished wall.



Step 3 — Install Control Stop (Figure 3)

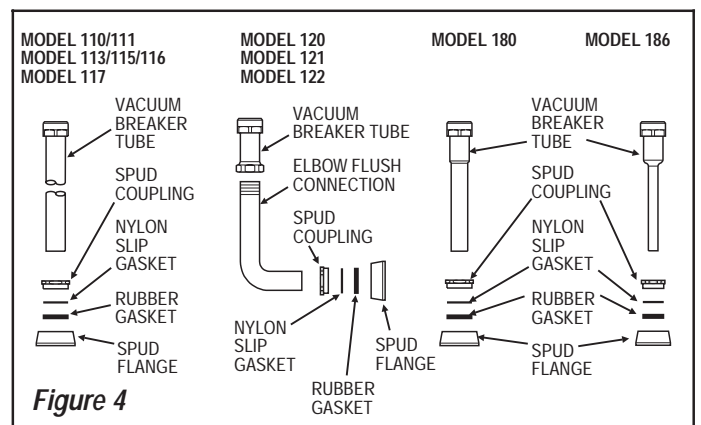
Install the Sloan Bak-Chek® Control Stop to the water supply line with the outlet positioned as required. Tighten the Control Stop coupling with a wrench. DO NOT install the Vandal Resistant Stop Cap at this time. Secure the Wall Flange and the Covering Tube with the Set Screw. Tighten with a 1/16" hex wrench.



Step 4 — Install Vacuum Breaker Flush Connection (Figure 4)

Note: Follow the instructions on the bag of your High Back Pressure Vacuum Breaker Kit included with your Flushometer: insert Baffle into groove of Vacuum Breaker Sack; insert Sack in Vacuum Breaker Tube; and place Friction Ring on top of Sack.

Slide the Spud Coupling, Nylon Slip Gasket, Rubber Gasket and Spud Flange over the Vacuum Breaker Tube and insert tube into Fixture Spud. Tighten the Spud Coupling onto the Fixture Spud by hand.



Step 5 — Install Flushometer (Figures 5A, 5B and 5C) SLOAN ADJUSTABLE TAILPIECE (Figure 5A)

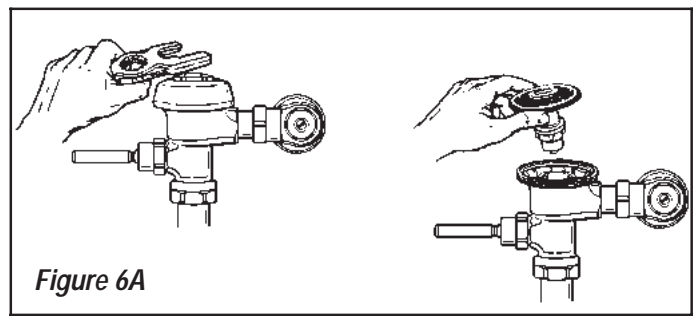
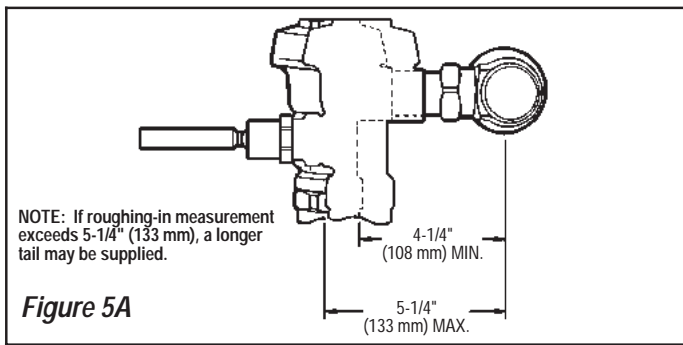
The Sloan Adjustable Tailpiece compensates for "off-center" roughing-in on the

IMPORTANT NOTES

With the exception of the Control Stop inlet, DO NOT USE pipe sealant or plumbing grease on any valve component or coupling!

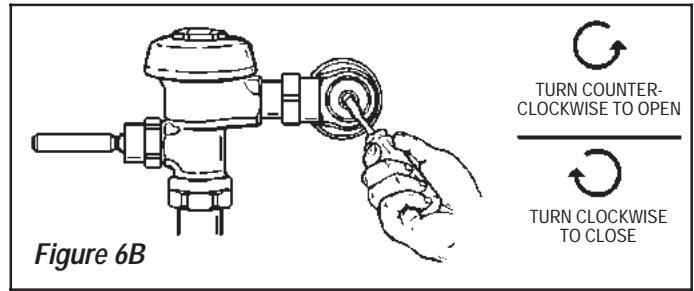
Protect the chrome or special finish of Sloan Flushometers — DO NOT USE toothed tools to install or service these valves.

Use a Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench to secure all couplings. Also see "Care and Cleaning" section of this manual.



Reinstall the Outside Cover. Tighten with wrench. Open the Control Stop. Turn on the water supply to flush any dirt, debris, or sediment from the line. Then shut off the Control Stop. Remove the Outside Cover.

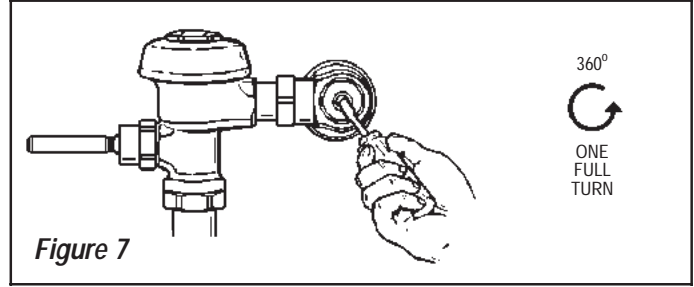
Inspect the Inside Parts Assembly featuring our Dual Filtered Diaphragm™. The upper ring is the secondary filter and includes the metered bypass. It is kept in position by three (3) bars that lock it into the top of the rubber diaphragm. The lower ring is the primary filter and slips into the lip on the lower side of the diaphragm. These two (2) plastic filtering rings should be in position on the upper and lower sides of the Permex® diaphragm. Insert the Inside Parts Assembly into the Flushometer Body. Install the Inside and Outside Covers. Tighten the Outside Cover with a wrench. Open the Control Stop and press the Handle to activate.



Step 7 — Adjust Control Stop (Figure 7)
Adjust Control Stop to meet the flow rate required for the proper cleansing of the fixture. Open Control Stop COUNTERCLOCKWISE one full turn from the closed position. Activate Flushometer. Adjust Control Stop after each flush until the rate of flow delivered properly cleanses the fixture.

Important: The Sloan Royal® Flushometer is engineered for quiet operation. Excessive water flow creates noise, while too little water flow may not satisfy the needs of the fixture. Proper adjustment is made when the plumbing fixture is cleansed after each flush without splashing water out from the lip AND a quiet flushing cycle is achieved.

After adjustment, install the Vandal Resistant Control Stop Cap to the Control Stop.



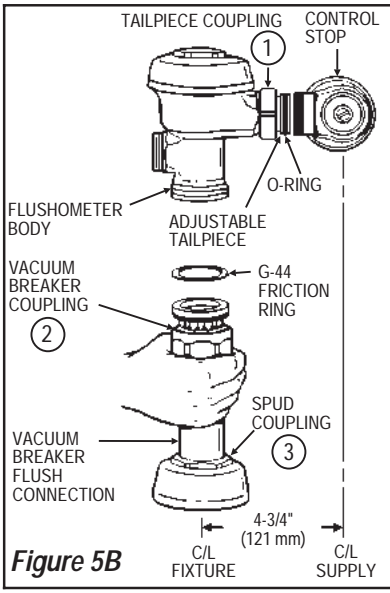
job. Maximum adjustment is 1/2" (13 mm) IN or OUT from the standard 4-3/4" (121 mm) (centerline of Flushometer to centerline of Control Stop).

SLOAN FLUSHOMETER BODY (Figure 5B)

Lubricate the tailpiece O-ring with water. Insert Adjustable Tailpiece into Control Stop. Tighten the Tailpiece Coupling by hand.

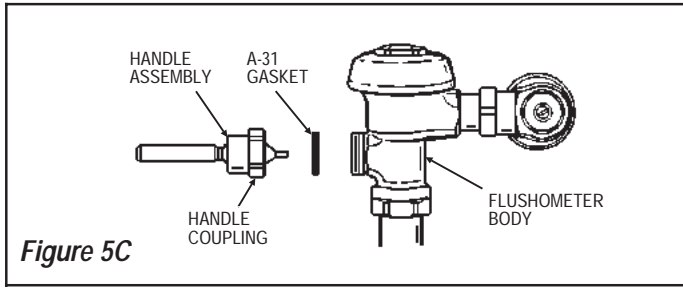
Align the Flushometer directly above the Vacuum Breaker Flush Connection. Tighten the Vacuum Breaker Coupling by hand.

Align the Flushometer Body and securely tighten first the Tailpiece Coupling (1), then the Vacuum Breaker Coupling (2), and finally the Spud Coupling (3). Use a wrench to tighten these couplings in the order shown.



SLOAN TRIPLE SEAL HANDLE ASSEMBLY (Figure 5C)

Sloan's triple-sealed Flushometer Handle is ADA-complaint. Install the red A-31 Handle Gasket on the Handle Assembly. Insert the Handle Assembly into the Handle opening in the Flushometer Body. Securely tighten the Handle coupling with a wrench.



Step 6 — Flush Out Supply Line (Figures 6A and 6B)
If your Control Stop has a Vandal Resistant Stop Cap in place, follow the Vandal Resistant Control Stop Cap Removal Instructions before proceeding.

Shut off Control Stop. Use the Sloan "SuperWrench™" to loosen the Outside Cover. Remove the Outside Cover and the Inside Cover. Lift out the Inside Parts Assembly (see Figure 6A).

IMPORTANT NOTES

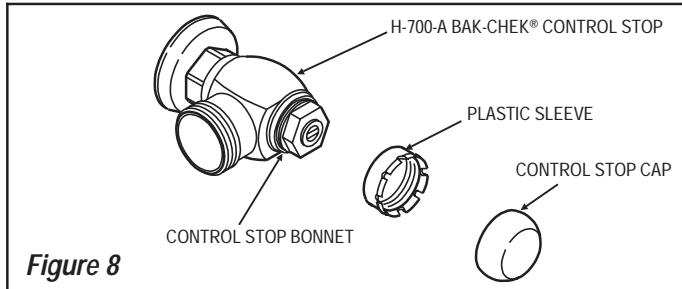
With the exception of the Control Stop inlet, DO NOT USE pipe sealant or plumbing grease on any valve component or coupling!
Protect the chrome or special finish of Sloan Flushometers — DO NOT USE toothed tools to install or service these valves.
Use a Sloan A-50 "Super-Wrench™" or smooth jawed spud wrench to secure all couplings. Also see "Care and Cleaning" section of this manual.

Step 8 — Install Vandal Resistant Stop Cap (Figure 8)

Thread the Plastic Sleeve onto the Stop Bonnet until it is snug (tighten only by hand; do not use pliers or a wrench).

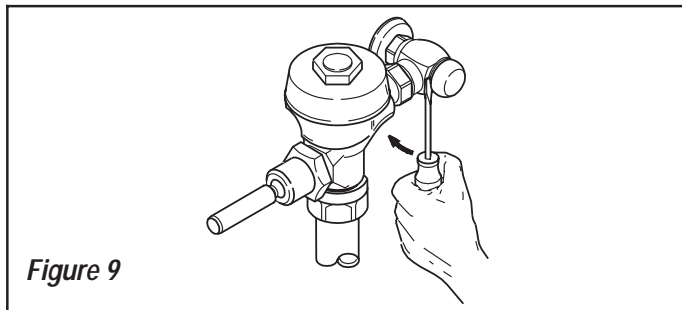
Place the metal Control Stop Cap over the plastic Sleeve and use the palm of the hand to push or “pop” the Cap over the fingers of the Plastic Sleeve. The Cap should spin freely.

Important: DO NOT install the Cap onto the Sleeve unless the Sleeve has been threaded onto the Control Stop Bonnet. If the Sleeve and Cap are assembled off of the Control Stop, the Sleeve WILL NOT come apart from the Cap.



VANDAL RESISTANT CONTROL STOP CAP REMOVAL INSTRUCTIONS (Figure 9)

Use a large flat screwdriver as a lever to remove the Cap from the Control Stop. Insert the screwdriver blade between the bottom edge of the Cap and the flat surface of the Control Stop body as shown in Figure 9. Push the screwdriver handle straight back toward the wall to gently lift the Cap. If necessary, work the screwdriver around the diameter of the Cap until you can grasp the Cap and lift it completely off the Sleeve. The Sleeve should remain attached to the bonnet of the Control Stop.



CARE AND CLEANING OF CHROME AND SPECIAL FINISHES

DO NOT use abrasive or chemical cleaners to clean Flushometers that may dull the luster and attack the chrome or special decorative finishes. Use ONLY soap and water, and then wipe dry with a clean cloth or towel.

While cleaning the bathroom tile, protect the Flushometer from any splattering of cleaner. Acids and cleaning fluids can discolor or remove chrome plating.

TROUBLESHOOTING GUIDE

I. Flushometer does not function (no flush).

- Control Stop or Main Valve is Closed. Open Control Stop or Main Valve.
- Handle Assembly is damaged. Replace Handle (B-73-A) or install Handle Repair Kit (B-51-A).
- Relief Valve is damaged. Replace Royal Performance Kit.

II. Volume of water is not sufficient to siphon fixture.

- Control Stop is not open wide enough. Adjust Control Stop for desired delivery of water volume.
- Dual Filtered Diaphragm Assembly is damaged. Replace Royal Performance Kit.
- Incorrect Dual Filtered Diaphragm Assembly is installed in Flushometer; for instance, Urinal assembly inside a Closet Flushometer, or Low Consumption assembly inside a higher consumption fixture. Determine the flush volume required by the fixture and replace Royal Performance Kit. Use valve label and markings on fixture for reference.
- Water supply volume or pressure is inadequate. If no gauges are available to properly measure supply pressure or volume of water at the Flushometer, then remove the Relief Valve from the Dual Filtered Diaphragm Assembly, reassemble the Flushometer and completely open the Control Stop.
 - If the fixture siphons, more water volume is required. Install a higher flushing volume Royal Performance Kit. **IMPORTANT — Laws and Regulations requiring Low Consumption Fixtures (1.6 gpf/6 Lpf Water Closets and 1.0 gpf/3.8 Lpf Urinals) prohibit the use of higher flushing volumes.**
 - If the fixture does not siphon or if a Low Consumption flush is required, steps must be taken to increase the water supply pressure and/or volume. Contact the fixture manufacturer for minimum water supply requirements of the fixture.

III. Length of flush is too short (short flush).

- Dual Filtered Diaphragm Assembly is damaged. Replace Royal Performance Kit.
- Handle Assembly is damaged. Replace Handle (B-73-A) or install Handle Repair Kit (B-51-A).
- Incorrect Dual Filtered Diaphragm Assembly is installed in Flushometer; for instance, Urinal assembly inside a Closet Flushometer, or Low Consumption assembly inside a higher consumption fixture. Determine the flush volume required by the fixture and replace Royal Performance Kit. Use valve label and markings on fixture for reference.

IV. Length of flush is too long (long flush) or continuous.

- Metering by-pass hole in Diaphragm is clogged. Remove the Dual Filtered Diaphragm Assembly. Remove the Primary and Secondary Filter Rings from the Diaphragm and wash under running water. Replace Royal Performance Kit if cleaning does not correct the problem.
- Diaphragm or Relief Valve is damaged. Replace Royal Performance Kit.
- Incorrect Dual Filtered Diaphragm Assembly is installed in Flushometer; for instance, Closet assembly inside a Urinal Flushometer, or Water Saver assembly inside a Low Consumption Flushometer. Determine the flush volume required by the fixture and replace the Royal Performance Kit. Use valve label and markings on fixture for reference.
- Inside Cover is damaged. Replace Inside Cover (A-71).
- Supply line water pressure has dropped and is not sufficient to close the valve. Close Control Stop until pressure is restored.

V. Chattering noise is heard during flush.

- Inside Cover is damaged. Replace Inside Cover (A-71).

VI. Handle Leaks.

- Handle Seal or Assembly is damaged. Replace Handle (B-73-A) or install Handle Repair Kit (B-51-A).

Refer to the Royal Flushometer Maintenance Guide for additional Troubleshooting and Repair Part information. If further assistance is required, please contact the Sloan Valve Company Installation Engineering Department at 800/982-5839.

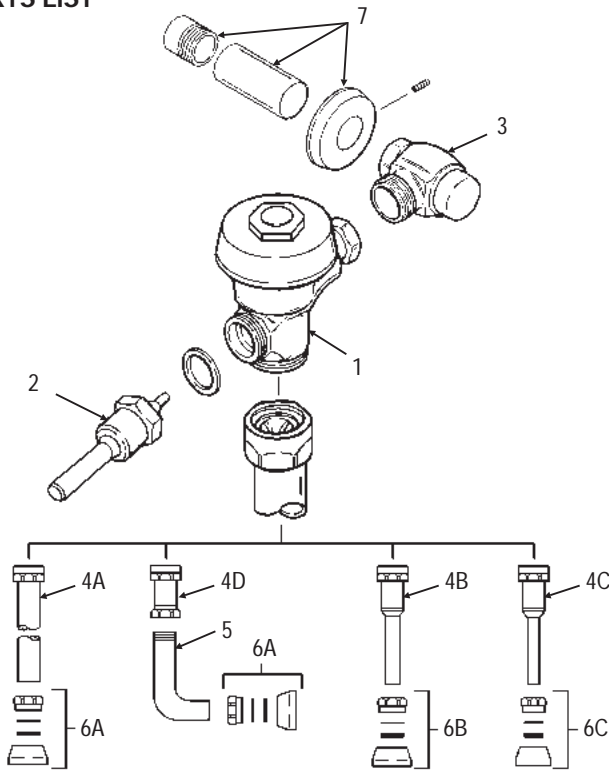
IMPORTANT NOTES

With the exception of the Control Stop inlet, DO NOT USE pipe sealant or plumbing grease on any valve component or coupling!

Protect the chrome or special finish of Sloan Flushometers — DO NOT USE toothed tools to install or service these valves.

Use a Sloan A-50 “Super-Wrench™” or smooth jawed spud wrench to secure all couplings. Also see “Care and Cleaning” section of this manual.

PARTS LIST



Item No.	Part No.	Description
1	†	Valve Assembly
2	B-73-A	ADA Compliant Handle Assembly
3	H-700-A	Bak-Chek® Control Stop
4A	V-600-AA	1-1/2" (38 mm) x 9" (229 mm) Vacuum Breaker Assembly ‡
4B	V-600-AA	1-1/4" (32 mm) x 9" (229 mm) Vacuum Breaker Assembly
4C	V-600-AA	3/4" (19 mm) x 9" (229 mm) Vacuum Breaker Assembly
4D	V-600-A	Vacuum Breaker Assembly
5	F-109	1-1/2" (38 mm) Elbow Flush Connection ‡
6A	F-5-A	1-1/2" (38 mm) Spud Coupling Assembly
6B	F-5-A	1-1/4" (32 mm) Spud Coupling Assembly
6C	F-5-A	3/4" (19 mm) Spud Coupling Assembly
7	H-633-AA	1" (25 mm) Sweat Solder Kit with Cast Set Screw Flange
	H-636-AA	3/4" (19 mm) Sweat Solder Kit with Cast Set Screw Flange

† Part number varies with valve model variation; consult factory.

‡ Length varies with valve model variation; consult factory.

For a complete listing of Flushometer Valve components and Repair Kits, see the Royal Maintenance Guide or consult your nearest Plumbing Wholesaler.

For optimum water conservation and Flushometer performance, use *only* Genuine Sloan Parts.

Manufactured in the U.S.A. by Sloan Valve Company under one or more of the following patents: U.S. Pats. 5,295,655; 5,505,427; 5,542,718; 5,558,120; 5,564,460; 5,649,686; 5,730,415. Other Pats. Pending. BAK-CHEK®, PARA-FLO®, PERMEX®, TURBO-FLO®, DUAL FILTERED DIAPHRAGM™.

Sloan's New Dual Filtered Diaphragm™ Assembly has been an exclusive feature of our Royal Flushometer since January 1998. Our design eliminates valve "run on" by capturing dirt and debris particles in a series of patented filters before they ever reach the metering bypass hole. Our Dual Filtered Diaphragm saves water and reduces flushometer valve maintenance.

Our Dual Filtered Diaphragm Assembly is factory assembled to assure accurate

flush delivery and is sold only in Royal Performance Kits. These Royal Performance Kits also include our B-51-A Handle Repair Kit with factory lubricated Triple Seal and our V-651-A High Back Pressure Vacuum Breaker Repair Kit. All of these components have been engineered to meet the performance demands of today's plumbing systems and are exclusive to the Royal Flushometer, the standard for use with Low Consumption fixtures.

Royal Performance™ Kits §

Royal Performance Kits can be used to upgrade older Royal, Regal and similar design Diaphragm Flushometer Valves. To identify the flush volume of the Dual Filtered Diaphragm Assembly, look at the shape and color of the relief valve, refill head, and flow ring(s).

Kit Number	Flush Volume	Fixture Application	Relief Valve	Refill Head ‡	Flow Ring(s)
A-1101-A	1.6 gpf/6.0 Lpf	Water Closets, Low Consumption	Green	Gray	Smooth
A-1102-A	3.5 gpf/13.2 Lpf	Water Closets, Water Saver	White	Gray	Smooth
A-1103-A	2.4 gpf/9.0 Lpf	Water Closets, 9 Liter European	Blue	Gray	Smooth
A-1106-A	0.5 gpf/1.9 Lpf	Urinals, Wash Down	Green	Black	Use two (2): Smooth & Slotted
A-1107-A	1.0 gpf/3.8 Lpf	Urinals, Low Consumption	Green	Black	Slotted
A-1108-A	1.5 gpf/5.7 Lpf	Urinals, Water Saver	Black	Black	Smooth

§ Kit includes:

- A — Dual Filtered Diaphragm Assembly
- B — Handle Repair Kit with Triple Seal Packing
- C — High Back Pressure Vacuum Breaker Repair Kit
- D — Tailpiece "O" Ring

‡ Water Closet Refill Heads (gray) have larger slots than Urinal Refill Heads (black).

SPECIAL APPLICATIONS

For old style blowout urinals that require 3.5 gpf (13.2 Lpf), use Kit No. A-1102-A. For wash down urinals that require 1.0 gpf (3.8 Lpf), use Kit No. A-1107-A. For older water closets that require 4.5 gpf (17.0 Lpf), use 3.5 gpf flush Kit No. A-1102-A and remove the Flow Ring.

For Service Sinks that require 6.5 gpf (24.6 Lpf), use Sloan Repair Kit No. A-36-A and remove the Flow Ring before installing.

NOTICE: The information contained in this document is subject to change without notice.

