

Microflush Half Gallon Toilets

Marine Heads Air Operated



Model LF-210



Model LF-219



Model LF-310



Model LF-320

Installation/Service Manual P/N 24533



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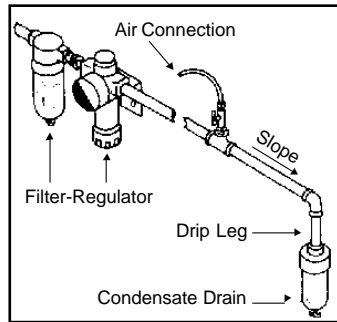
THANK YOU FOR PURCHASING A MICROPHOR® PRODUCT!

Your Microflush® Marine Head is designed to provide you with years of reliable service while using only two quarts of salt or fresh water per flush. Please read this Owner's Manual completely prior to installation of your Microflush Marine Head. This will familiarize you with all of the proper installation and operation requirements.

CUSTOMER SERVICE - Please contact your local Microphor dealer for parts and service. For a list of dealers, please contact Microphor at the addresses listed on the cover of this manual.

AIR SYSTEM

Filter-regulators are available in a variety of sizes and types. Their purpose is to remove water, oil and other foreign matter from the air line and to maintain a constant pressure **at the toilet of**



60-65 PSI. The following steps must be observed to assure moisture will be removed from the airline:

1. Drain air compressor receiver regularly. Most water tends to accumulate at this point.
2. Install drip legs with condensate drains at all low points in air piping.
3. Whenever possible, grade all airlines back to the air receiver or drip leg assembly and drain regularly.
4. The air supply to your Microflush Marine Head must be taken from the top of the main or branch air line.

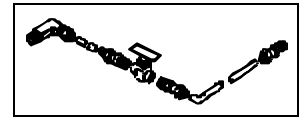
AIR COMPRESSOR

Be certain compressor crankcase has proper oil levels. Locate the compressor in a clean, dry, well ventilated location. Size compressor according to separate Air Compressor Specifications Sheet.

ITEM	LF-210	LF-219	LF-310 LF-320
Air Line Connection	Compression		1/4" 45° Flare Fitting
Water Line Connection	1/2" MIPS Slip Joint Nut	3/4" ID Hose Barb	1/2" FNPT Fitting
Drain Connection	Down	12" (305mm) on center-line	2.25" (57mm); 3.6" (91mm) off center-line
	Rear	1-1/2" outlet, 3/4" (19 mm) off centerline	Centerline
Remote Valve Assembly	Must be mounted so vacuum breaker is located 6" above rim of toilet bowl.		

1 PRE-INSTALLATION

Following procedures apply to all Microflush models unless otherwise noted.



Remove your Marine Head from box carefully.

Integral Models - Install toilet seat and flush handle before mounting Microflush to floor. Seat is not included with LF-210 and LF-219 models. Bolt caps and closet screws are provided with LF-210 and LF-219 models.

When the flush handle is pressed the flapper opens, allowing wastewater to flow into the hopper. Clean water enters the bowl from the rim to thoroughly wash the bowl.

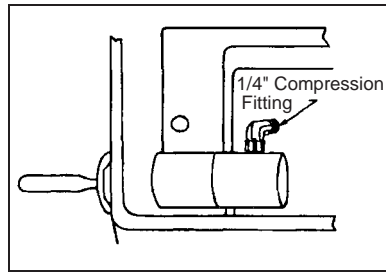
After 4-8 seconds, the flapper closes. Clean water continues to flow into the bowl, where it remains until the next flush.

When the flapper has closed, compressed air enters the hopper, pushing the waste over the trap and into the wasteline.

Grfc:210-op

2 AIR LINES

All piping supplied by customer is to conform to U.S.C.G. requirements relating to water tight decks and bulkhead (46CFR56.69)



Be sure airline from compressor is of sufficient size, based on length of pipe run to head. We suggest 3/8" air line up to 40', 1/2" air line up to 75', and 3/4" air line for over 75'.

Install a filter-regulator assembly in incoming airline. Place the filter-regulator as close as possible to the first Microflush Marine Head and in an accessible location.

Set filter-regulator so that **60-65 psi constant is available at the head**. Install an in-line air dryer, Microphor P/N 30054 or combination filter/regulator/dryer, P/N 94036.

Assemble the Air Connecting Kit provided and connect to incoming air line with shut-off valve between bulkhead and toilet. For LF-210 Models, use Air Connecting Kit P/N 93086, and for LF-219 Integral Models use Air Connecting Kit P/N 95172. The plastic airline provided goes from the air supply to the Flush Activator. On integral models, the plastic air line enters the Microflush through the back wall or up through the floor under the unit. Make sure air is OFF at air compressor.

DO NOT CONNECT TO FLUSH ACTIVATOR YET!

3 WATER LINES

Use a 1/2" water line and install a water shut-off valve (angle stop) between bulkhead and toilet. Water **at the head** must be regulated at an even pressure between **20 to 50 PSI** for Microflush to operate properly. Optimum pressure is 35 PSI. **DO NOT CONNECT WATER LINE TO MICROFLUSH YET.**

INSTALLATION PROCEDURES

4 DRAIN CONNECTION - See Rough-in Dimensions

For direct overboard discharge, contact Microphor or your dealer.

When using a 1-1/2" (38.1 mm) discharge line, each toilet must go individually to the MSD or holding tank. Do not connect more than one toilet to a 1-1/2" (38.1 mm) discharge line.

If a vertical rise is required, the vertical rise must be at the toilet. The maximum vertical rise is 36". The maximum horizontal run is 30 feet (9.14 meters) and must slope a minimum of 1/8" per foot (1 in 100) towards the MSD or holding tank. For 1-1/2" lines, reduce horizontal pipe run 2 feet (.68 meters) per 90° elbow. Use long sweep elbows, do not use 45° elbows. **Do not use the inverted P-Trap with a vertical rise.**

When multiple heads are installed, a vented 3" gravity collection line is to be used with not more than 4 heads per 3" line. Manifold the 1-1/2" lines into the 3" collection line and provide a grade of at least 1/4" per foot towards the MSD or holding tank. Vent 3" line at the manifold point.

Holding tank or MSD must be vertically vented to atmosphere via 3" vent, terminating at highest point possible.

For holding tank installations, consider installing a power fan sized so that a volume of air equal to the empty tank volume is exchanged every 30 to 60 seconds. The negative pressure shall not exceed -1.3 psi. This will allow for good air flow out the vent.

Your Microflush Marine Head discharge line must have a rise (trap) in order to provide back pressure during the flush cycle - see Rough-in Dimensions on pages 14-15.

Caution: Do not apply stress to align Microflush rear or downward discharge outlet to waste line. This will result in eventual damage to seal between Hopper and Toilet Bowl, causing leaking. **Do not** use the P-Trap with a vertical rising waste line.

LF-210 Downward Discharge Model: Rest Microflush on its back on a padded surface (e.g. shipping box). Center wax ring over Hopper Flange. Turn Microflush Marine Head over, lift up, and center it with the horn of the wax ring into standard floor flange located on centerline 12" from wall. Compress the wax ring by applying weight to your Microflush Marine Head. A second standard wax ring may be added if floor is uneven. If Hopper Flange hits floor flange, grind it down for added clearance, as any contact will break seal between Hopper and Toilet Bowl, causing leaking.

All Rear Discharge Models: Install inverted P-Trap supplied with Microflush Marine Head. Do not glue or connect fittings until fitting alignment has been checked.

Caution: Outlet of LF-210 and LF-219 Models is 3/4" off centerline. Make sure head discharge and waste line are in line, not off set.

When using a 1-1/2" discharge line, a vertical lift of 36 inches can be achieved in single head applications. The vertical rise must be at the toilet. This vertical application is not advised for commercial, high use applications. Do not use the P-Trap with a vertical rising waste line. Please contact the factory for further information.

LF-219 Model: For downward discharge, use molded P-Trap hose supplied. For rear discharge use inverted P-Trap. See page 9 for part numbers.

Remote Models: Position and mount the Remote Valve Assembly making sure the Vacuum Breaker is at least 6" above the rim of the Microflush Marine Head bowl. Measure air and water lines to make sure Remote Valve is mounted within connection distance to Microflush Marine Head. Run water and the three air lines from the Remote Valve Assembly to Microflush.

Caution: For Remote Flush Activators, make sure inside wall thickness does not exceed 1/2" or large mounting nut will restrict movement of flush handle.

Mount toilet bowl to floor. LF-210 and LF-219 models mount to floor with 1/4" closet bolts provided. Screw on bolt caps to mounting screws. Model LF-310 and LF-320 models are bolted to floor, bolts not provided.

LF-320 Models:

- 1 Remove side panels to facilitate mounting toilet.
- 2 Connect 7' water line to Spud fitting at the back of the toilet bowl.
- 3 Run water and the three air lines from the Microflush through wall access (maximum 7 feet).
- 4 Position toilet and connect hopper discharge outlet to waste line.
- 5 Bolt toilet to floor and attach back plate to wall. Do not reposition toilet after it is connected to the waste line as this may break the seal between bowl and Hopper and cause a water leak. Re-install side panels on toilet.
- 6 Connect the three air supply lines to the Air/Water Sequence Valve, color coded lines to matching color coded fittings.
- 7 Mount Remote Valve Assembly at least 6" above the rim of the bowl, and mount the Flush Activator assemblies at desired location on wall.

5 WATER CONNECTION

Never install a check valve on the inlet side of the Microflush head.

Integral Models - Connect incoming water from angle stop to water connector. Make sure WATER IS OFF at angle stop. LF-210 Models -water supply connector is made of nylon-plastic. Be careful not to cross threads.

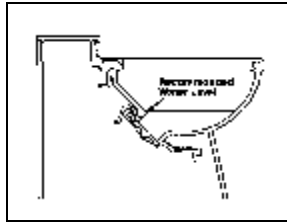
LF-219 Models - if integral model is connected to a potable water source, the unit requires installer to provide a Back Flow/Cross Contamination Prevention device. Please check applicable jurisdiction for requirements before installation.

LF-310 Models - use back-up wrench on water inlet. DO NOT allow inlet fitting to turn and be forced into Air/Water Sequence Valve.

Remote Models - Connect incoming water from angle stop to Microflush Hose Barb on the Remote Valve Assembly. Connect the water line from Remote Valve Assembly to the Flush Rim Spud Assembly. Make sure WATER IS OFF at angle stop.

START UP

- 1 Turn air ON air supply at compressor.
- 2 Turn air ON at air shut-off cock (near but not connected to Flush Activator) to blow out airlines for a few seconds. This procedure should remove any debris or contaminants from the airline. Turn air OFF at shut-off valve.
- 3 Connect airline to Flush Activator. Make sure air shut-off valve is installed next to Flush Activator. Do not over-tighten fittings.
- 4 Turn ON air shut-off cock. Check total installation for air leaks using soapy water.
- 5 Turn ON water. Check for water leaks.
- 6 Flush you Microflush Marine Head four times, waiting twenty seconds between flushes to get water through system and operating regularly. To flush properly, hold down Flush Activator Handle or Button until flapper opens.



DOUBLE CHECK

- 1 Air pressure at Microflush Head is at 60-65 psi.
 - 2 Water Pressure at Microflush Head is between 20-50 psi, 35 psi optimal.
 - 3 Water level in bowl should be at top edge of flapper opening.
- If your Microflush does not operate correctly, refer to troubleshooting sections.

FLUSH CYCLE ACTIVATORS

There are two types of Flush Activators:

- Standard - hold handle or button down for 1 second.
- Positive - barely push handle or button to activate.

CLEANING BLEED-OFF PLUG ASSEMBLY

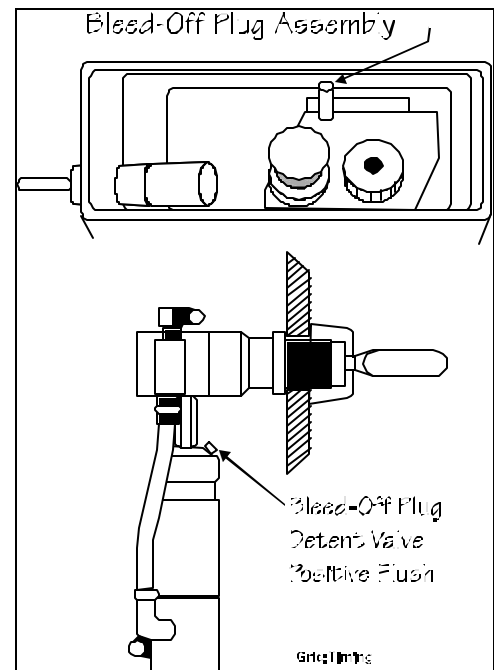
Standard Flush:

Remove plug and clean with solvent; air blow dry.

Positive Flush:

Remove plug and clean with solvent; air blow dry; remove and clean plug on Detent Valve.

Note: Use 5/32" or 4mm Allen wrench to remove plugs.



Note: Bleed-Off Plugs on Air & Water Sequence Valves and Detent Valves are different sizes that are not interchangeable.

MAINTENANCE/CLEANING/CLEARING/ WINTERIZING

ROUTINE MAINTENANCE

Your Microflush Marine Head has an air-operated Air/Water Sequence Valve which requires periodic lubrication with a silicone based lubricant. Check your application at right to determine how often to lubricate your Air/Water Sequence Valve. The Air Cylinder should be serviced if you have to take up your Microflush Marine Head for any reason. **The air system must be free of moisture. Drain air receiver regularly to remove moisture.**

USAGE	LUBRICATE
Light	Every 5 years
Medium	Every 2-3 years
Heavy	Every year

CLEANING

Use Micro-Clean Organic Spray Cleaner, P/N 24542. **Sanitizers like Lysol, Pine-Sol, Hexol, ammonia base products, caustic drain openers or non-biodegradable cleaners should never be used if the plumbing system is connected to a Microphor MSD.**

- 1 While depressing the Flush Activator, turn OFF the water. Allow the bowl cleaner to flow into the lower chamber. Keep the Flushing Activator depressed.
- 2 Insert bowl brush into lower chamber and agitate mixture carefully. Remove the bowl brush and release the flush activator.
- 3 Turn the water ON and flush twice to rinse thoroughly.

NOTE: LF-310 or LF-320 Stainless Heads may be subject to surface rusting, especially if salt water is used for flushing and if bleach or a corrosive product or cleaner is left standing in or on the bowl. The salt water will enhance the oxidation qualities of the bleach (or product containing bleach). If it sits on the stainless and the surface remains damp, the chrome and nickel will etch out of the stainless, leaving ferrite iron, which will rust. If bleach or any cleaner is used, it must be well rinsed, not left standing (soaking) in the bowl or on the toilet, especially in toilets using salt water.

CLEARING YOUR MICROFLUSH HEAD

If your Microflush Marine Head becomes plugged, shut off the water supply, press the flush handle and hold. The flapper will remain open until flush handle is released. Check to see if the restriction can be removed from lower portion of Microflush Marine Head with a hooked wire, being careful not to damage the rubber seal on the flapper or the mating surface on the hopper. If obstruction cannot be picked out with a hook or tongs, use plunger by pushing in slowly and pulling out quickly to pull object back into the hopper. If necessary, turn air off and use a snake inserted through a short plastic pipe placed in hopper. Pipe will protect flapper seal. If valve will not operate with water off, hold flush lever down and turn water on and off quickly to free valve action. When the passage becomes clear, turn on water and press flush handle to start flush cycle.

WINTERIZING (out-of-service winter storage)

Shut OFF water to Microflush Marine Head. Flush Microflush Marine Head three times or until water no longer flows into the bowl. Unhook water supply at angle stop. Empty water in line into receptacle. Shut OFF air supply to your Microflush Marine Head. The unit is now prepared for freezing temperatures. OPEN petcocks on drip legs and air receiver drain after shutting down air compressor and isolating airlines. Use of Anti-freeze is not recommended.

PATENTS

Microflush® Toilets are covered by one or more of the following U.S. patents: 5245710; 4918764; 1280554; 169471 and related foreign patents.

WARNINGS

- Do not use any petroleum based lubricants (Vaseline) on any rubber parts or o-rings as damage will occur. Use only silicone based lubricants.*
- Do not use any 'Locktite' brand adhesives on any plastic or Delrin components as fumes will cause damage.*
- Do not use Teflon tape on any air fittings as clogging may occur.*

DESIGN CHANGES

Continuing a policy of research and development, Microphor reserves the right of price, product or design change without notice or obligation.

TROUBLESHOOTING

Your Microflush® toilet is designed to give you years of trouble-free operation. Please check the following before beginning any service or repair:

- Water supply:
- 1 Is the water turned on?
 - 2 Is the water pressure between **20 and 50 psi at the toilet** for pressure water system?
 - 3 Is there 6 feet minimum of head for gravity systems?

Fluctuating or high water pressure can cause intermittent problems with the toilet operation. Check the water pressure at different times of the day (i.e., early morning, noon, evening) to determine if you have fluctuating or high water pressure. A pressure-reducing valve installed on the incoming water line will assure you have even pressure. Make sure no check valve is installed before the Air/Water Sequence Valve.

- Air system:
- 1 Is the air turned on?
 - 2 Is the air pressure set at a constant **60-65 psi at the toilet**?
 - 3 Do you have any air leaks or kinks in the air system?
 - 4 **Do you have water in the air system?** This usually causes irregular timing.

Drain the compressor tank and check the filter regulator and drip leg(s) for water. To check for water in Air/Water Seq. Valve, remove Bleed-Off Plug, put finger over screw opening and flush. If water is present, it will squirt out. If water is detected, then the air cylinder and airlines must also be drained.

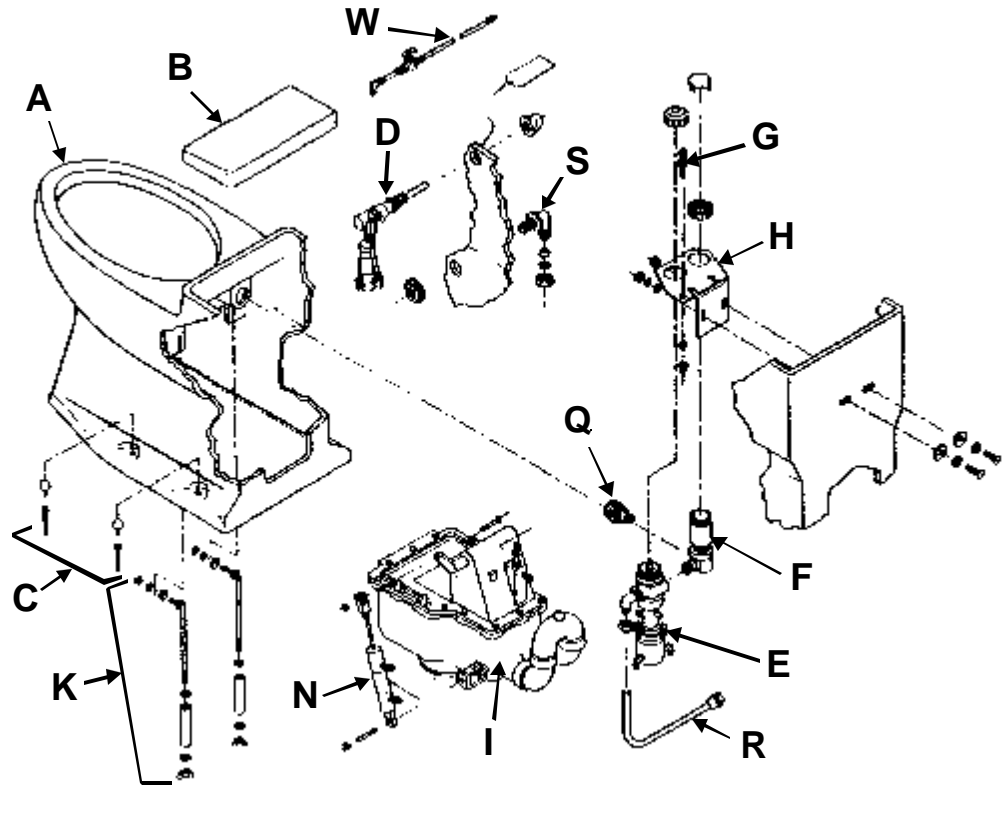
- Cycle time:
- 1 Is the flapper cycle time set correctly at 4-8 seconds?
 - 2 Is the bleed off assembly plug blocked? Remove, clean and reinstall (see page 5).

Trouble	Possible Causes	Correction
Flapper does not open. Water does not flow. Nothing happens.	<ol style="list-style-type: none"> 1 No Air Supply to Microflush. 2 Water has accumulated in Air/Water Sequence Valve 	<ol style="list-style-type: none"> 1 Supply compressed air at 60-65 psi at the toilet 2 See "Check Air System" above.
Flapper opens and closes 4-8 seconds after handle is released, but no water enters bowl.	<ol style="list-style-type: none"> 1 No water supply to Microflush. 2 Water turned off. 	<ol style="list-style-type: none"> 1 Supply water at 20-50 psi. 2 Open angle stop (shut-off valve).
Flapper opens when flushed, and closes immediately when activator is released.	<ol style="list-style-type: none"> 1 Excessively high water pressure. 2 Debris in check valve at base of Air/Water Sequence Valve. 	<ol style="list-style-type: none"> 1 Install water pressure regulating valve, set at 20-50 psi. 2 Clean Air/Water Seq. Valve.
Flapper opens and will not close.	Bleed Off plug blocked.	Remove, clean or replace, reinstall.
Water continues to run when Microflush is not in use.	Foreign object is under water valve in Air/Water Sequence Valve.	Clean Air/Water Sequence Valve. Reference Service Kit P/N 95057.
Water splashes when flushed.	Water is too high in bowl.	Reduce incoming water via angle stop.
Flush cycle is too long.	Bleed-Off Plug blocked.	Remove, clean or replace, reinstall.
Flush cycle is too short.	Air line leakage.	Check for air leakage at all connections.

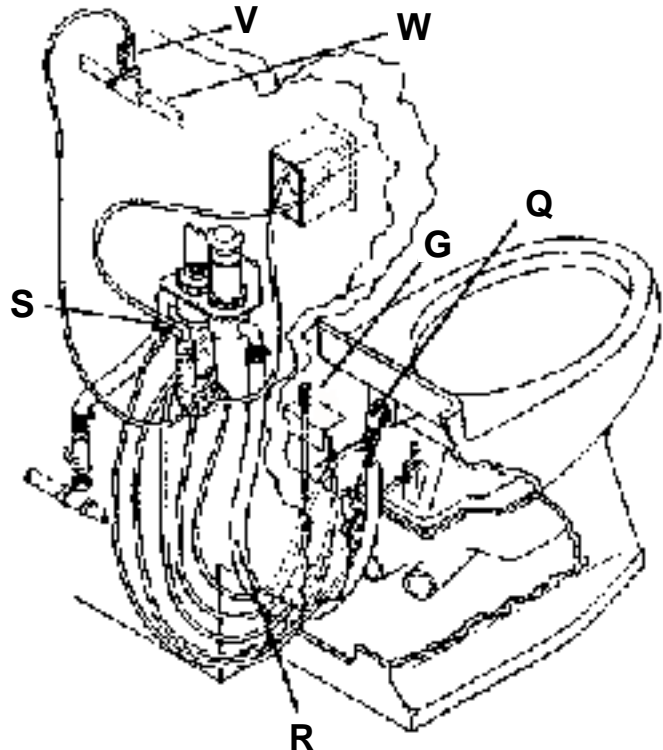
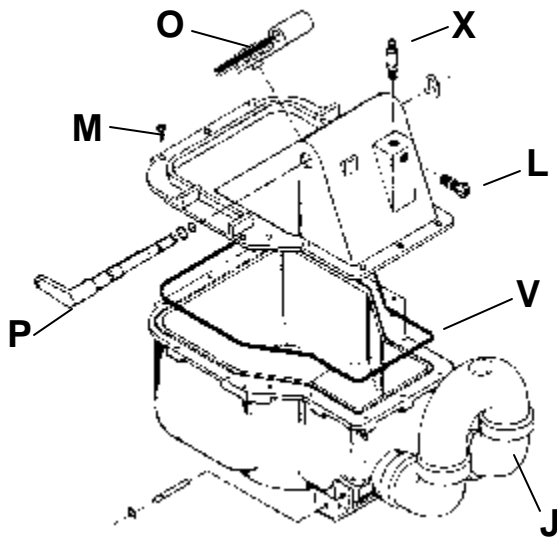
If other problems are encountered, please contact the factory: Toll Free: 1-800-358-8280

EXPLODED VIEWS

- A Toilet Shell
- B Toilet Lid
- C Closet Screws
- D Flush Activator
- E Air/Water Seq. Valve
- F Vacuum Breaker
- G Bleed Off Assembly
- H Valve Bracket
- I Hopper
- J P-Trap, Rear Discharge
- K Hopper Mounting Assembly
- L Marine Bleed Valve
- M Hopper Screws
- N Air Cylinder
- O Flapper Assembly
- P Crank Assembly
- Q Spud Assembly
- R Water Supply Tube
- S Water Connection
- T See chart on next page
- U See chart on next page
- V Hopper Gasket
- W Air Supply Kit
- X Pressure Relief Valve



Typical Remote Assembly



PARTS CHART

	MODEL PART	LF-210 China Round	LF-210 China Elongated	LF-219 China Round Integral & Remote	LF-310 SS Round	LF-320 SS Round
A	Toilet Shell	44032 - white colors - see chart	44010 - white colors - see chart	44151 - integral, white 44133 - remote, white colors - see chart	93082 - shell 93084 - top shroud 93085 - bottom shroud colors - see chart	93008 - shell colors - see chart
B	Toilet Lid	99064 - white 99073 - bolt down, white colors - see chart		Not applicable		
C	Closet Screws & Bolt Caps	93972 - white colors - see chart			Not applicable	
D	Flush Activator	95002 - standard 95054 - positive		40046-5/40049-5 int, wht 40046-9/40049-9 int, blk 40046-7/40049-7 int, bone 95151 - remote	95561 - standard	95031 - standard
E	Air/Water Sequence Valve	39501 - no fittings				
F	Vacuum Breaker	33559 - integral 33039 - remote		33421 - check valve 33039 - remote	96539 - integral	33039 - remote
G	Bleed-Off Plug Assembly	94598			30382-3	94598
H	Valve Bracket	91897 - integral 20003 - remote		91866 - integral 20003 - remote	Not applicable	20003 - remote
I	Hopper	90016-3 - rear 90008 - downward conversion kit		90016-3 - rear 95157 - downward hose	90039 - 3 rear 40050-3 Tank isolation valve	
		40050-3 tank isolation valve 27282 - Hopper Adaptor O-ring				
J	P-Trap, Rear Discharge	96029				
K	Hopper Mounting Assy	90899-5			00006 (4 each) and 00106 (4 each)	
L	Hopper Bleed Valve	37548				
M	Hopper Screws	00064 (14 each)			00064 (10 each)	
N	Air Cylinder	94540				
O	Flapper Assy	90048				
P	Crank Assy	90042				
Q	Spud Assy	96347		95155	96579	
R	Water Supply Tube	96012 - integral 35053 - remote		35484 - integral 35484 - remote	96002	96008
S	Water Connection	96387		N/A - integral 33352 - remote	96515	33352
T	Air Fittings	30385 - 90 Elbow, 30365 - Straight				
U	Air Tubing/ft	green - 35381, blue - 35382, red - 35383, yellow - 35384, white - 35385, black - 35419				
V	Hopper Gasket	27272			27270	
W	Air Supply Kit	93086			N/A	
X	Pressure Relief Valve	37518				

COLOR CHART - AIR LINE CONNECTIONS - SERVICE KITS

VITREOUS CHINA COLOR CHART

Color	Code	LF-210			LF-219	
		Round Shell & Lid	Elongated Shell & Lid	Lid Only	Remote Shell	Integral Shell
White	--	44032	44010	99064	44133	44151
Pastel Ivory	SC1	44327	44328	99064-23	44133-3	44150
Bone/Natural	S4	44039	44012	99064-3	44134	44152
Harvest Beige	SC4	44333	44334	99064-15	NA	N/A
Pink	SR2	44331	44332	99064-21	NA	N/A
Grey	651	44329	44330	99064-5	44135	44153
Black	N-5	44337	44338	99064-7	44130	44154

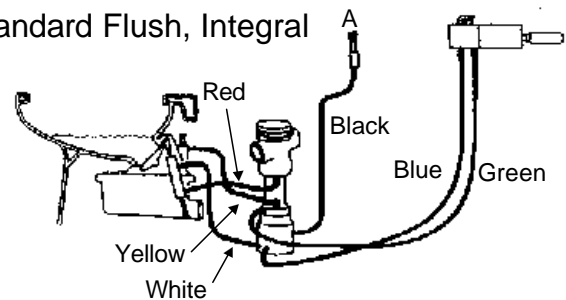
AIR LINE CONNECTIONS

From Air/Water Sequence Valve	To
Red, P/N 35383	Air Cylinder, bottom fitting
White, P/N 35385	Air Cylinder, top fitting
Black, P/N 35419	Bleed Off Plug
Green, P/N 35381	Flush Activator, front fitting
Blue, P/N 35382	Flush Activator, back fitting
Yellow, P/N 35384	Hopper

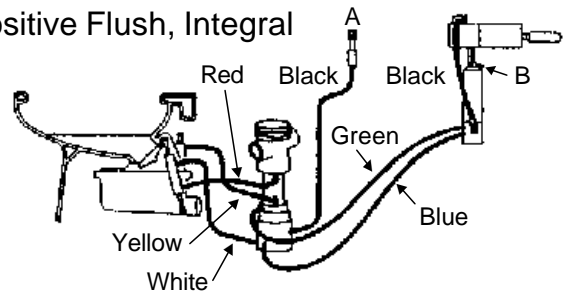
SERVICE KITS

#	P/N	Description
1	93100	Master Service Kit (2-5 below)
2	95057	Air/Water Sequence Valve
3	94502	Air Cylinder
4	95020	Flush Activator Pilot Valve (standard)
5	95037	Vacuum Breaker
6	95122	Positive Flush (Detent) Valve
7	90066	Flapper Replacement Kit
8	90070	Hopper Conversion Kit - Rear
9	90071	Hopper Conversion Kit - Bottom

Standard Flush, Integral



Positive Flush, Integral



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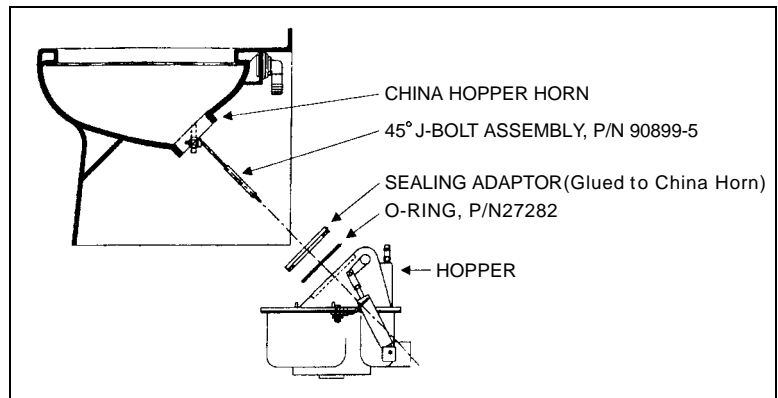
HOPPER REPLACEMENT

Model LF-210 and LF-219 Models Only

CAUTION: Read this entire procedure before beginning work!

1. Remove toilet from floor. Place toilet upside down on a sheet of cardboard or other padded material.
2. Remove nuts from J-bolts on either side of hopper, lift hopper from bowl.
3. Remove o-ring between hopper and seal adaptor. Check that o-ring is not damaged, replace if necessary.
4. Re-assemble in reverse order.

MAKE SURE J-BOLTS ARE TIGHT!



Note: The air cylinder on the hopper sub-assembly should be cleaned, lubricated and checked for adjustment whenever the toilet assembly is removed for servicing.

TANK ISOLATION VALVE INSTALLATION (Not supplied with toilet.)

Note: Check valve halves for tightness before installing.

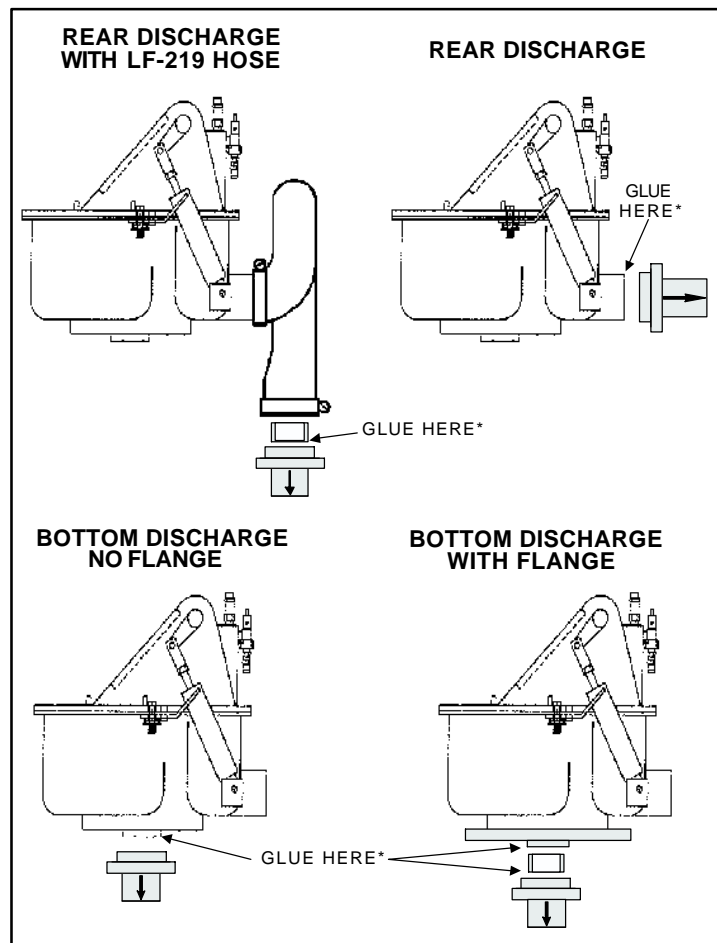
Rear Discharge with LF-219 Downward Hose
Install Tank Isolation Valve Assembly in line at the end of the discharge hose using a 1-1/2" long pipe nipple.

Rear Discharge
Glue tank isolation valve assembly to hopper at point indicated.

Bottom Discharge, No Flange
Glue Tank Isolation Valve Assembly directly to hopper discharge as indicated.

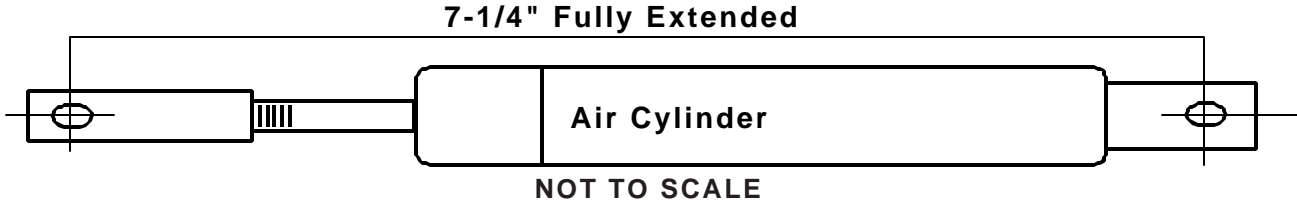
Bottom Discharge with Flange (1-1/2" pipe)
Glue 1/2" long pipe nipple to hopper discharge port as indicated, and glue Tank Isolation Valve assembly to pipe nipple.

NOTE: Isolation Valve is in two pieces; tighten valve before installation and again before making drain connection!



AIR CYLINDER ADJUSTMENT

- 1 Remove Hopper (see Hopper Replacement).
- 2 Remove the clevis pin retaining ring. Remove the clevis pin.
- 3 Inspect the crank arm, clevis and clevis pin for wear. Replace if required.
- 4 Hold the crank arm in the UP position (flapper closed).
- 5 Fully extend the air cylinder and note the position of the holes in the crank arm and the clevis. The clevis hole should extend half its diameter past the crank arm hole.
- 6 Adjust as necessary by loosening the locknut and extend or retract the clevis as required.
- 7 Re-install Hopper.



TO CHANGE FLAPPER GASKET:

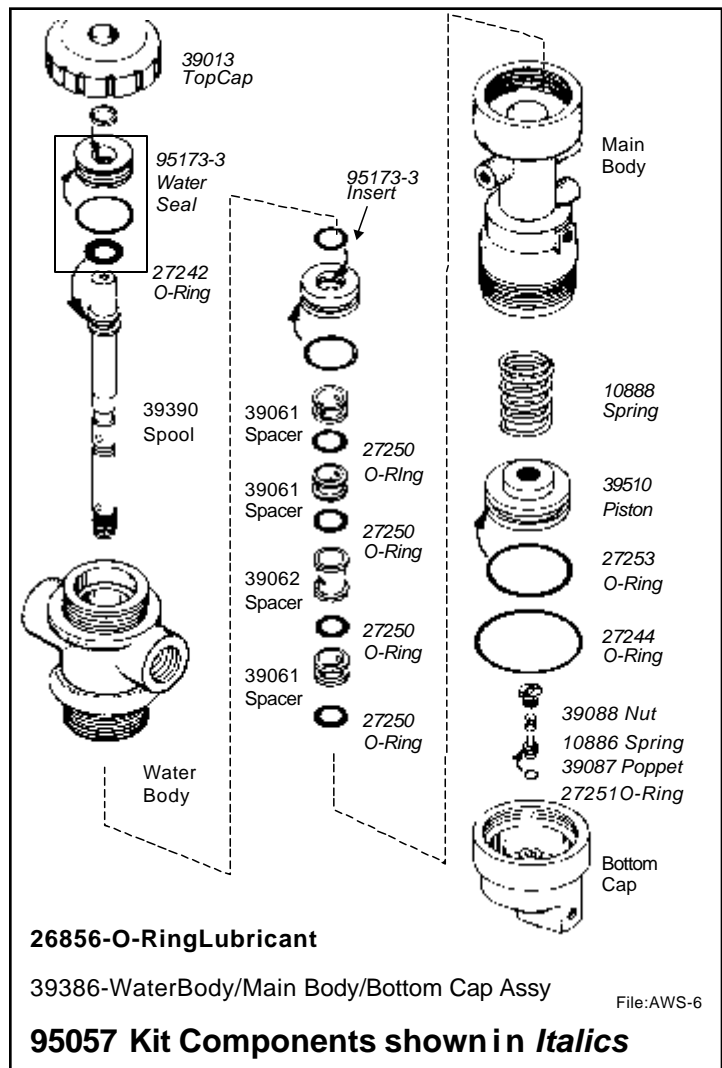
1. Turn water and air off.
2. Reach behind flapper to grasp gasket tails.
3. Pull tails out of slots to remove old gasket.
4. Installation is the reverse of removal.
5. Tails must be pulled all the way through to insure smooth surface.

AIR/WATER SEQUENCE VALVE COMPONENTS

Components shown in *italics* are part of Kit, P/N 95057.

Spacers and Spool available as a set, P/N 95530.

Water Body, Main Body and Bottom Cap available as a set, P/N 39386.



AIR/WATER SEQUENCE VALVE OPERATION

1. In the normal rest position, pressurized air enters the Flush Activator and goes from Flush Activator Port 1 (green tube) to Air/Water Sequence Valve Port 2, through Port 3 (red tube) to Air Cylinder Port 4 holding the Flapper closed, sealing the water in the bowl and maintaining a proper water surface area.

2. When the Flush Activator is pressed, air is shifted to Port 5 (blue tube) to A/W Seq. Valve Port 6 and on to Air Cylinder Port 8 (white tube). The air in the base of the Air Cylinder is bled off through Port 4 (red tube) to Port 3 and out Vent [1], allowing the Air Cylinder to retract, opening the Flapper. Simultaneously, pressurized air in the base of the A/W Seq. Valve pushes the piston and spool assembly up to open the water passage, allowing water to enter and rinse the bowl. The air on the top of the piston is bled off through Port 1 and out Vent [2].

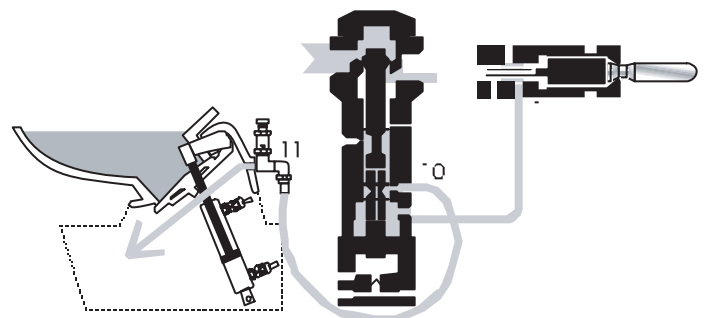
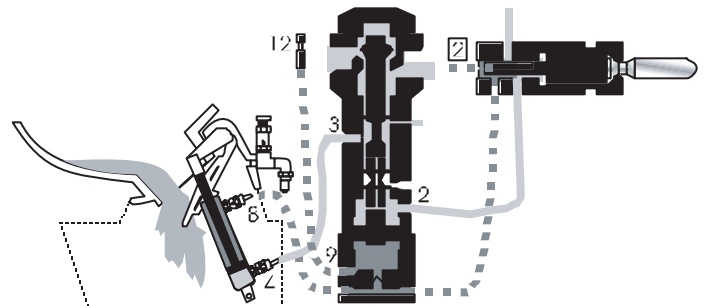
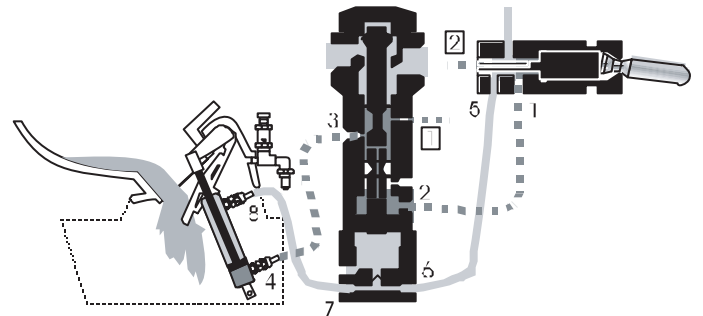
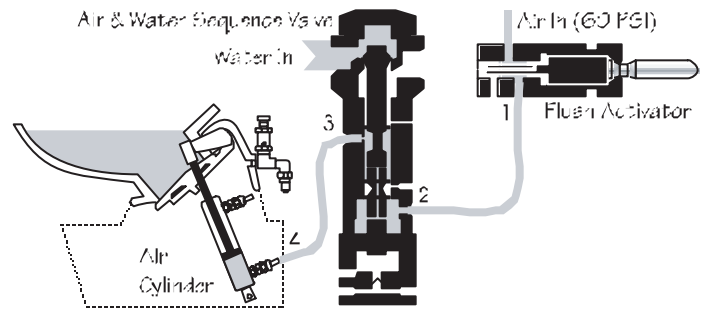
3. As the Flush Lever is released, the Flush Activator returns to the normal rest position redirecting pressurized air to Port 2, Port 3 and Port 4. The Bleed-Off Plug [12] bleeds off the air (black tube) under the piston, causing the spool to move downward, gradually closing the water passage-way. The air having been bled off the top of the Air Cylinder Port 8 (white tube) through the end of the Flush Activator Vent [2] (blue tube), allows the Air Cylinder to close the Flapper allowing water to accumulate in the bowl, restoring a proper water surface area.

4. Near the bottom of the piston stroke, the air passageway from Port 10 (yellow tube) to the Hopper Port 11 is unblocked for 4-11 seconds to pressurize the hopper and expel the waste contents over the trap and into the waste line.

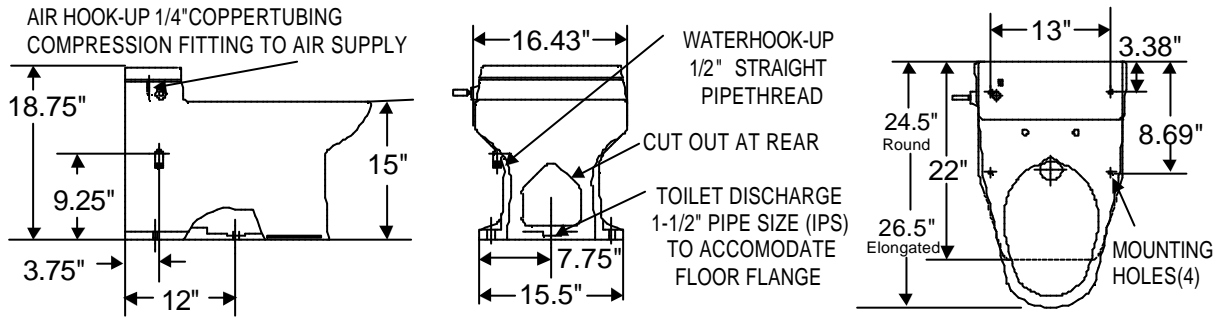
5. As the A/W Seq. Spool reaches the bottom position, the water supply is shut off, completing the flush cycle.

In the event of air supply failure, the spring in the Air/Water Sequence Valve maintains the valve in the closed position, blocking the water passage-way. The flapper will open and allow water in the bowl to flow into the hopper forming a water seal.

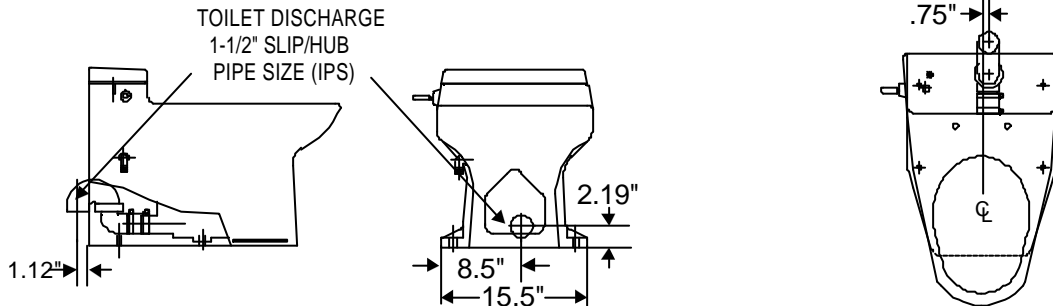
Grfc: AWS-bw



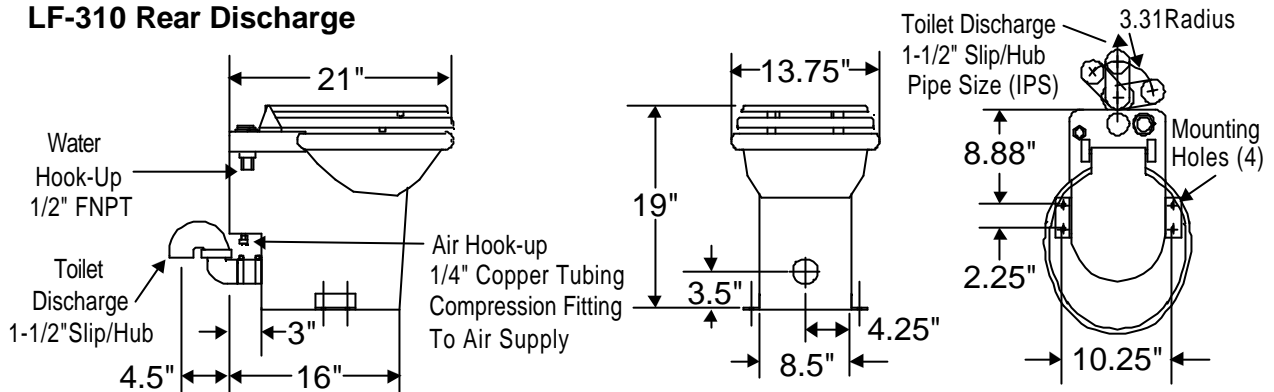
LF-210 - Downward Discharge



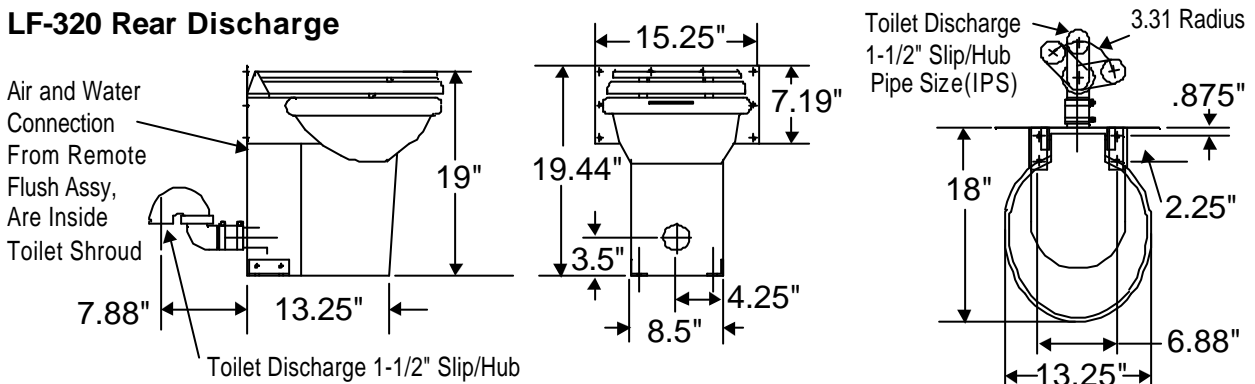
LF-210 Rear Discharge



LF-310 Rear Discharge



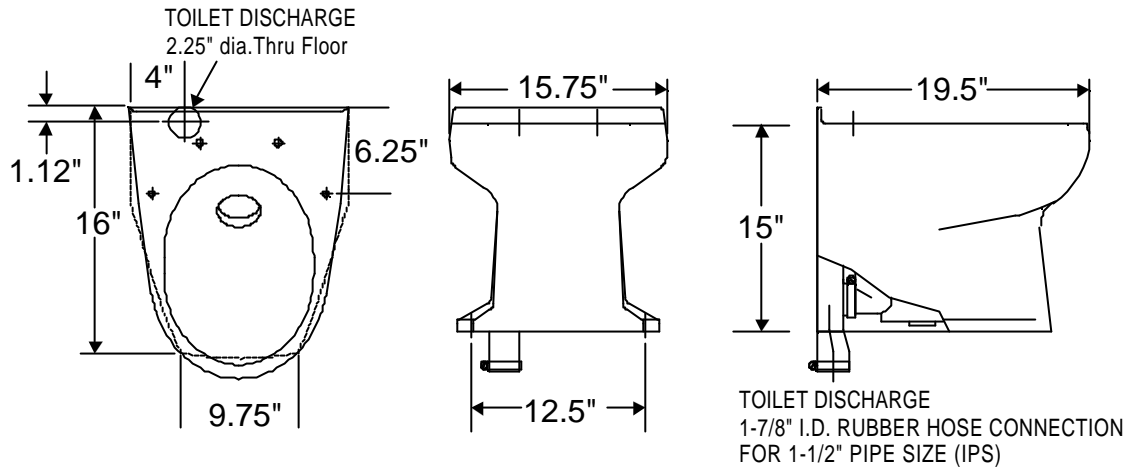
LF-320 Rear Discharge



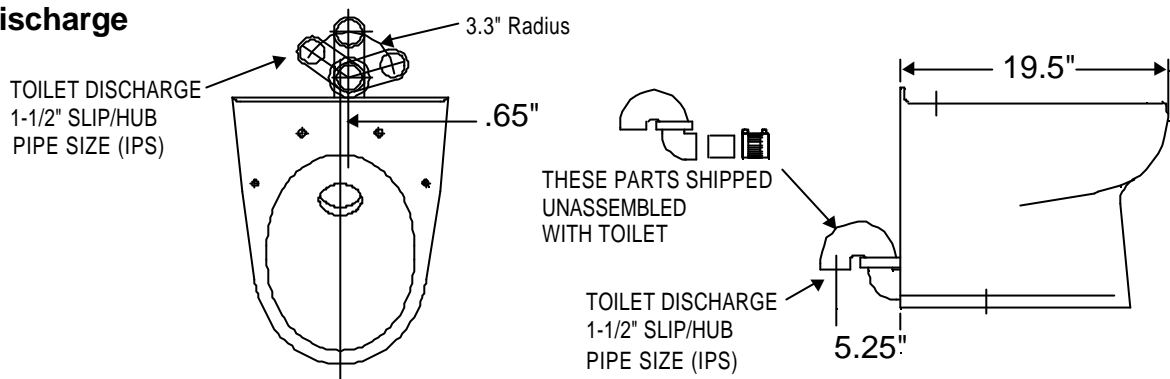
Reference Remote Flush Rough-In, next page.

NOTE: Do not use P-Trap in vertical rise waste line applications.

Downward Discharge

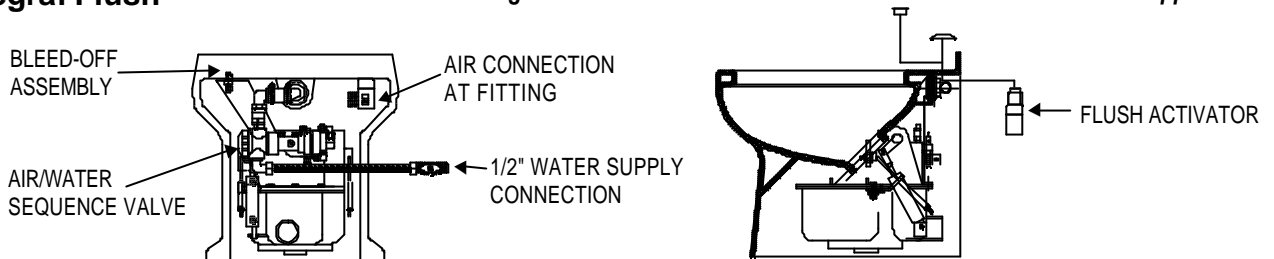


Rear Discharge

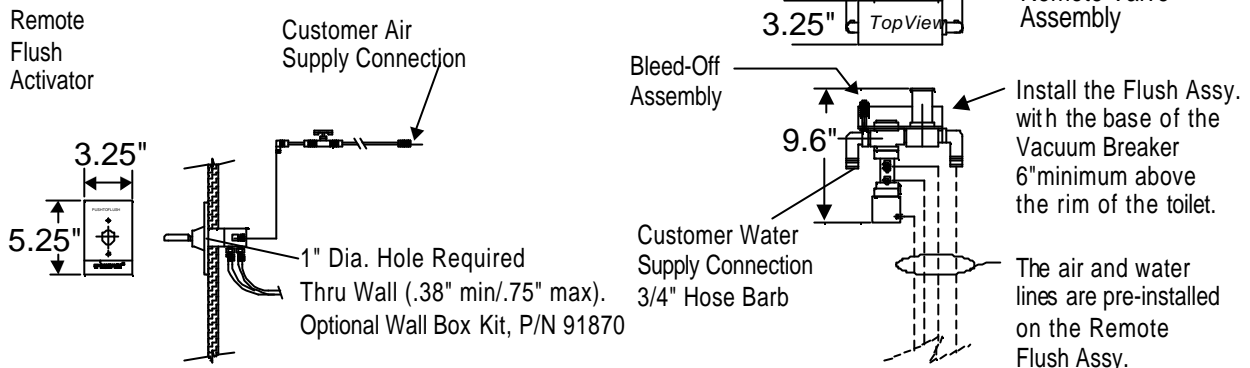


Integral Flush

Integral Check Valve - No Vacuum Breaker - Check Local Code for Approval.



Remote Flush Rough-In



THE MAXIMUM WATER LINE DISTANCE BETWEEN THE TOILET AND THE REMOTE FLUSH ASSY IS SIX (6) FEET.

Gfc:219-Spec