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Model LF-510 and LF520 Air-Operated Toilets

Installation and Service Manual



MICROFLUSH® One-Quart Flush Toilets

Manual No: 24174

Rev: 09/26/12

THANK YOU!

Thank you for purchasing a Microphor product. Please read this manual completely prior to installation of your MicroFlush toilet. Microphor General Terms and Conditions Covering Sales apply.

CUSTOMER SERVICE

If you have any questions concerning your Microphor product, please contact us at 1-800-358-8280 or visit our website at www.microphor.com.

PATENTS

MicroFlush toilets are covered by one or more of the following U.S. and foreign patents: 4,918,764; 1,280,554; 169,471; 5,254,710.

CHANGES IN DESIGN

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

CAUTIONS

1. Water Pressure at the toilet must be regulated at an even pressure between 20 to 50 PSI at the toilet, if used with a pressurized water system. If gravity fed water is supplied, 6 feet minimum head is required.

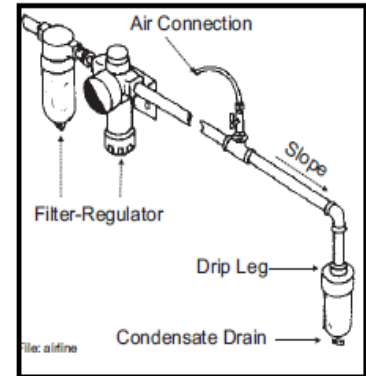
Note: *The flapper water level will be lower at water pressures less than 2.5 PSI (6 ft of head). The water seal of the flapper does not require complete submersion because the flapper seal gasket completely seal the hopper.*

2. Air Pressure at the toilet must be regulated at 60-65 PSI static.
3. **Do not use any Loctite brand adhesives on any plastic or Delrin parts because the fumes will cause damage to the components.**
4. **Do not use products containing petroleum distillates or formaldehyde on any rubber parts.**
5. **Only use silicone lubricant**
6. **To reduce the risk of clogging do not use Teflon tape on any air fittings**

AIR SYSTEM DESIGN

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 stream and to maintain a constant pressure of 60-65 PSI at the toilet. The following steps must be observed to ensure that moisture will be removed from the airline:

1. Drain air compressor receiver regularly.
2. Most water tends to accumulate at this point.
2. Install drip legs with condensate drains at all low points in the air piping.
3. Whenever possible, slope all air lines back to the air



- receiver or drip leg and drain regularly.
4. The air supply to the toilet must be taken from the top of the air line.

AIR COMPRESSOR

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

INSTALLATION PROCEDURES

Read Installation Procedures completely regarding all installation and start up points prior to installation.

AIR CONNECTION

Install a filter-regulator assembly in the air line. Place the filter-regulator as close as possible to the first toilet and in an accessible location. The plastic air line (provided with Air Connecting Kit PN 93086) from the air source connects to the toilet at the flush activator. Install an air shut-off valve at the toilet. Do not over-tighten the fittings on the toilet. Blow any debris from the air line prior to connecting to the toilet. **For proper operation, regulate the air pressure between 60-65 PSI static at the toilet.**

Where an air main is required, such as a 1/2" copper line, the air line to the toilet should be connected to the top of the line to prevent condensation reaching the toilet.

NOTE: See page 6 for airline connection locations

WATER CONNECTION

LF-510: 1/2" NPT(F)

LF-520: 3/4" I.D. Hose

If using a pressurized water system, water pressure must be regulated at an even pressure between 20-50 PSI at the toilet for proper operation

If using a gravity-fed water system, pressure must be 2.5 PSI at the toilet, for this a 6 ft minimum head is required.

Note: The flapper water level will be lower at water pressures less than 2.5 PSI (6 ft of head). The flapper does not require total submersion because the flapper gasket provides a complete hopper seal.

Toilets using pressurized water will need a flow control valve to ensure 1 quart flushing. Use Microphor PN 96515.

DRAIN CONNECTION - See Rough-In Dimensions

The rear discharge line should be connected at the hopper with a No-Hub Coupling (PN 33324, provided). Do not glue or connect fittings until fitting alignment has been checked. The toilet discharge line must have an inverted p-trap within 7" of the hopper to provide a water trap seal for back pressure in the hopper to allow good evacuation.

LF-510 INSTALLATION

Reference Exploded View (Page 5)

1. Remove back shroud and valve cover to facilitate toilet mounting.
2. Connect the discharge outlet at the back of toilet to the discharge line. Ensure that the discharge line is in-line with the toilet outlet.
3. Connect the air supply line to the air inlet at the back of the toilet.
4. Connect the water supply line to the water inlet on the side of the toilet (1/2" FNPT).
5. Bolt the toilet to the floor and attach the back plate to the wall. Do not reposition toilet after it is connected to the waste line because this might break the seal between the toilet bowl and the hopper causing a water leak. Reinstall the toilet side panels.

6. Connect the three air supply lines to the Air/Water Sequence Valve; color coded lines to matching color coded fittings.
7. Connect the water line to the Air/Water Sequence Valve push-on barb or compression fitting.
8. Position and mount the Remote Valve Assembly so that the Vacuum Breaker is at least 6" above the rim of the toilet.
9. Install a Filter-Regular between the toilet and the incoming air supply. The regulator must be set at 60-65 PSI or toilet will not function properly.

START-UP

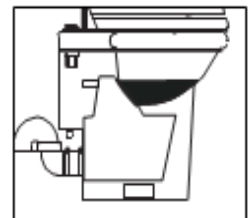
1. Turn on the water to the toilet. Check for any leaks.
2. Turn on the air to the toilet. Check the total installation with soapy water for any air leaks.
3. Flush the toilet four times, waiting twenty (20) seconds between flushes to get the water through the toilet and operating properly. To flush properly, hold down the handle or flush button until the flapper opens.
4. Check that the water level in bowl is approximately at the top edge of the flapper opening.

Note: The flapper water level will be lower at water pressures less than 2.5 PSI (6 ft of head). The flapper does not require total submersion because the flapper gasket provides a complete hopper seal.

5. If the toilet does not operate properly, refer below to the Adjusting Toilet or to the Troubleshooting section of this manual.

ADJUSTING TOILET

Turn the water supply fully ON. If necessary, adjust the water level in the bowl to the correct height at the top edge of the flapper by adjusting the water shut-off valve located next to toilet.



GENERAL CLEANING

Use MicroClean Organic Spray Cleaner, PN 24542. Caustic drain openers or non-biodegradable cleaners should not be used if the plumbing system is connected to a septic tank or biological treatment system. Clean as follows:

1. While depressing the flush activator, turn OFF the water. Allow the bowl cleaner to flow into the lower chamber. Keep the flush activator depressed.
2. Insert a bowl brush into the lower chamber and agitate the mixture. Be careful not to damage the flapper seal.
3. Remove the brush and release the flush activator.
4. Turn the water ON, flush twice and rinse thoroughly. To clean toilet hopper, use MicroScrub, PN 24827.

Note: LF-510 or LF-520 stainless steel toilets might 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. Salt water will enhance the oxidation qualities of the bleach (or of a 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.

TOILET CLEARING

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

ROUTINE MAINTENANCE

The MicroFlush toilet requires periodic lubrication with silicone based lubricants. See Service Kits (page 6).

Usage Lubricate

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

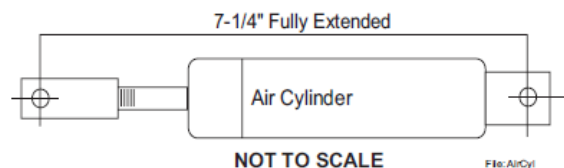
Note: Most railroad applications have an automatic lubricator installed

WINTERIZING (Winter Storage)

Shut OFF the water to the toilet. Flush the toilet three times or until water no longer flows into the bowl. Unhook the water supply at the angle stop. Empty the inline water into a receptacle. Shut OFF the air supply to the toilet. The unit is now prepared for freezing temperatures. OPEN the petcocks on the drip legs and air receiver drain after shutting down the air compressor and isolating the air lines.

AIR CYLINDER ADJUSTMENT INSTRUCTIONS

1. Remove the side shrouds or hopper if necessary.
2. Remove the clevis pin retaining ring and 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 clevis. The clevis hole should extend half its diameter past the crank arm hole. Adjust as necessary by turning the clevis clockwise to loosen, counterclockwise to tighten. Make sure not to nick or damage the shaft.
6. Reinstall the side shrouds or hopper.



CHANGING THE FLAPPER GASKET

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

TROUBLESHOOTING

The 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 pressurized water systems?
3. Is there a minimum 6 feet 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: 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 ensure you have even pressure. Make sure that there is not a check valve is installed before the Air/Water Sequence Valve.

Note: The flapper water level will be lower at water pressures less than 2.5 PSI (6 ft of head). The flapper does not require total submersion because the flapper gasket provides a complete hopper seal.

Air Supply

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. If water is suspected, drain the compressor tank and check the filter regulator and drip leg(s).

To check for water in the Air/Water Sequence Valve, remove the Bleed-Off Valve or Plug, put a finger over the screw opening and flush. If water is present, it will squirt from the sides of the valve body. If water is detected, then the air cylinder and air lines must also be drained.

Cycle Time

1. Is the flapper cycle time set correctly between 4-8 seconds?
2. Is the bleed off valve or plug blocked? If yes, remove, clean and reinstall or replace.

TROUBLESHOOTING REFERENCE TABLE

Trouble	Possible Cause	Corrective Action
Flapper does not open. Water does not flow. Nothing happens.	<ol style="list-style-type: none">1. No air supply to toilet2. Water has accumulated in Air/Water Sequence Valve	<ol style="list-style-type: none">1. Provide compressed air at 60-65PSI to the toilet2. See, Air Supply, above

Flapper opens and closes 4-7 seconds after handle is released, but no water enters the bowl.	1. No water supply to toilet 2. Water turned off	1. Provide water at 20-50 PSI 2. Open angle stop (shut-off valve)
Trouble	Possible Cause	Corrective Action
Flapper opens when flushed, and closes immediately when activator is released	1. Excessively high water pressure 2. Debris in check valve at base of Air/Water Sequence Valve	1. Install water pressure regulating valve, set between 20-50 PSI 2. Clean Air/Water Sequence Valve
Flapper opens but will not close	Bleed-off Valve or plug is blocked	Remove, clean, reinstall or replace
Water continues to run when toilet is not in use	An obstruction is under the water seal in the Air/Water Sequence Valve	Remove, clean, reinstall or replace Air/Water Sequence Valve
Water splashes during flush	Water is too high in bowl	Reduce the incoming water volume via the angle stop (shut-off valve)
Flush cycle is too long	Bleed-off valve or plug is blocked	Remove, clean, reinstall or replace
Flush cycle is too short	Air line leak	Check for air leaks at all connections

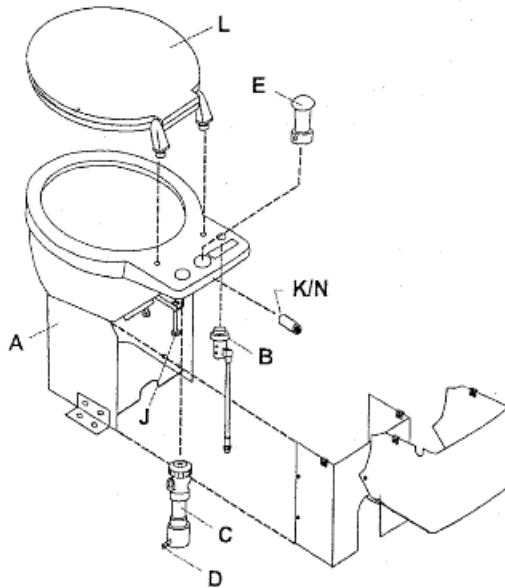
If other problems are encountered, please contact Microphor toll-free at 1-800-358-8280.

SERVICE KITS

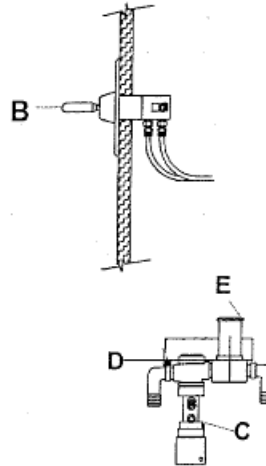
Master Service Kit	93100
Air/Water Sequence Valve Kit	95187
Air Cylinder Kit	64502
Flush Actuator Kit, Standard	95020
Vacuum Breaker Kit	95037
Flapper Replacement Kit	92043

EXPLODED VIEWS - REPLACEABLE PARTS - SERVICE KITS

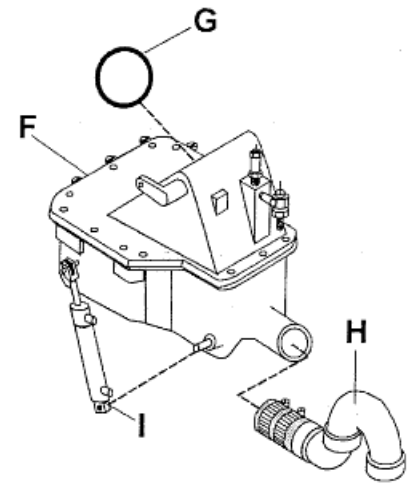
LF-510



LF-520 VALVES

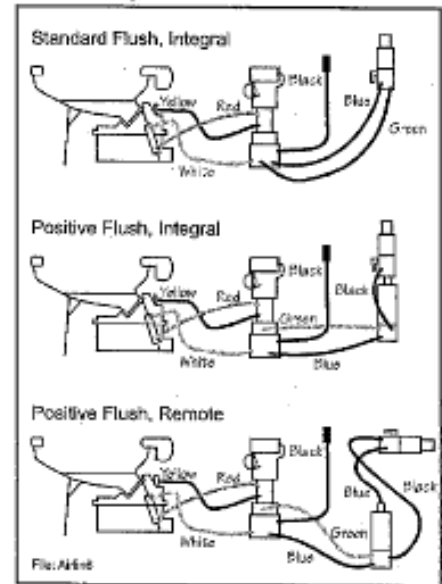


LF-510 & 520 HOPPER

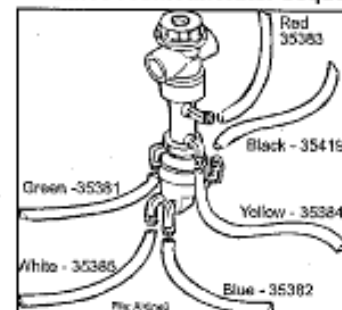


PART	DESCRIPTION	LF-510 Internal	LF-520 Remote
A	Toilet Shell (SS Finish) Valve Cover Back Shroud	93083-5 93084 93085	93008-7 20019 (2)
B	Flush Actuator/Pilot Valve	95561	95563
	Pilot Valve Only	95562	95566
C	Air/Water Sequence Valve	39014	39014
D	Bleed-Off Valve	39521	
	Bleed-Off Plug	30382-3	
E	Vacuum Breaker	33539	
F	Hopper Assembly, Rear	90039	
G	Gasket, Hopper to Bowl	27215	
H	P-Trap	96029	
I	Air Cylinder	94540	
J	Mounting Assembly, Hopper	00006 (4 ea) 00106 (4 ea)	
K	Water Supply Tube	96006	
L	Toilet Seat	99070	
M	Spray Ring (not shown)	94204 94204-3	
N	Flow Restrictor, Barbed	94171	

Air Line Layouts



Air Lines From Air/Water Sequence Valve

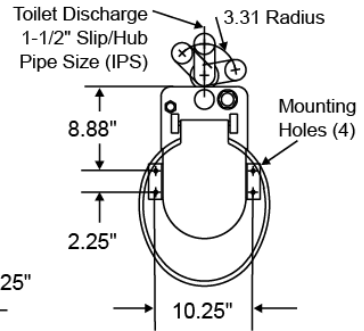
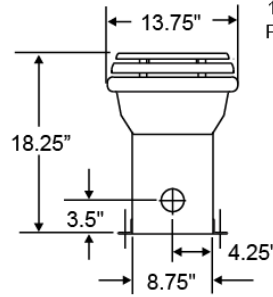
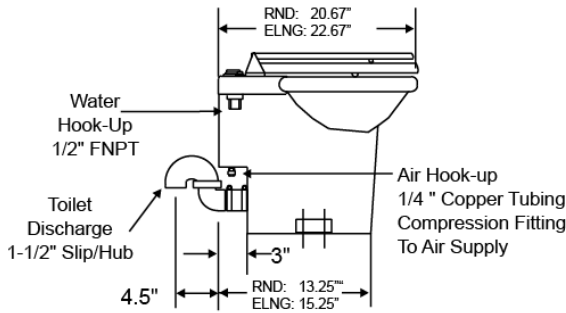


MICROFLUSH® LF-510 & LF-520® Ultra Low One Quart Flush

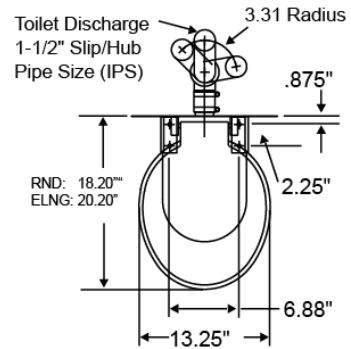
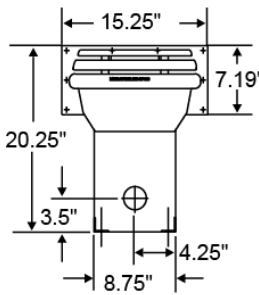
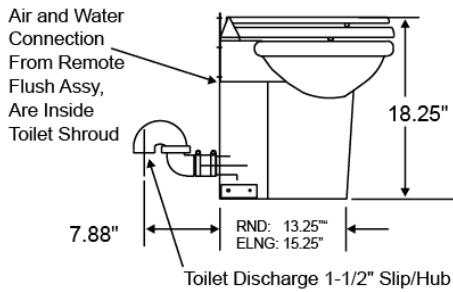
ROUGH-IN DIMENSIONS

(All Dimensions +/- 0.5")

LF-510 Rear Discharge

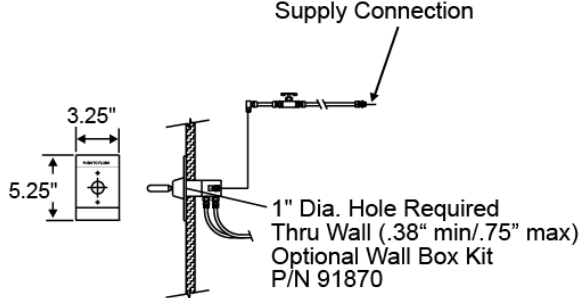


LF-520 Rear Discharge

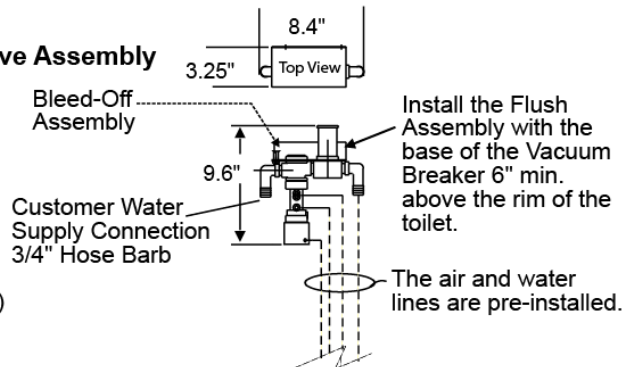


Remote Flush Rough-In

Flush Activator



Valve Assembly



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

NOTE: GRAVITY MODEL MAY NOT HAVE VACUUM BREAKER.

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