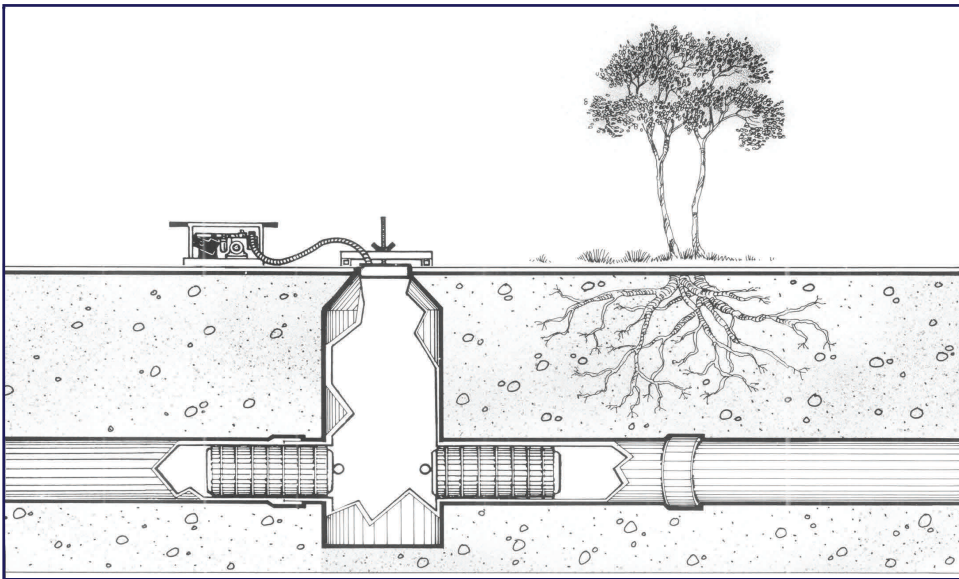


LANsas Products

MANHOLE VACUUM TESTING EQUIPMENT

OPERATION AND MAINTENANCE MANUAL



Atlanta Branch
Ph: (770) 919-0456
1155 Allgood Road
Suite 11
Marietta, GA 30062

LANsas® Products
Manufactured by Vanderlans & Sons, Inc.
PH: (800)452-4902
FAX: (209)339-8260
1320 South Sacramento Street, Lodi, CA 95240

Houston Branch
Ph: (832) 831-4458
6260 Brookhill Drive
Houston, TX 77087

LANsas® PRODUCTS
Manufactured by Vanderlans & Sons, Inc.

Operation and Maintenance Manual – Manhole Vacuum Testing Equipment

INTRODUCTION: LANSAS[®] Products Vacuum Testing Equipment is designed to perform vacuum tests on newly installed or rehabilitated manholes structures as well as on pipelines. Please refer to the currently accepted ASTM Standard for the testing specifications in each case.

EQUIPMENT:

Description: Vacuum Pump with gasoline powered engine.

PART No.: **121-00H**, Engine Driven Vacuum Pump (Honda)

PART No.: **120-00**, Engine Driven Vacuum Pump (Briggs & Stratton)



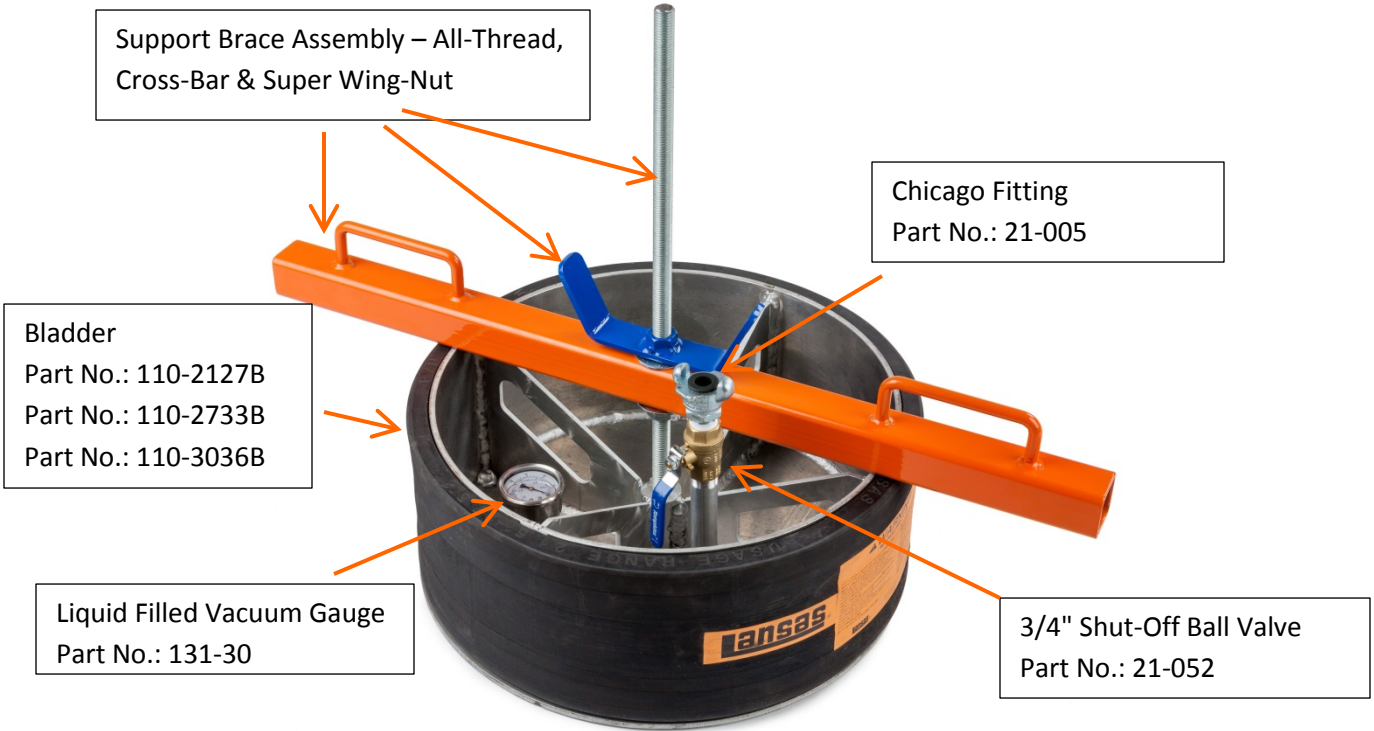


Description: Bladder Style Vacuum Test Head Assemblies

PART No.: **110-2127**, 21.5" – 27.5" Multi-Size Bladder Style Vacuum Test Head Assembly

PART No.: **110-2733**, 27.0" – 33.0" Multi-Size Bladder Style Vacuum Test Head Assembly

PART No.: **110-3036**, 30.0" – 36.0" Multi-Size Bladder Style Vacuum Test Head Assembly

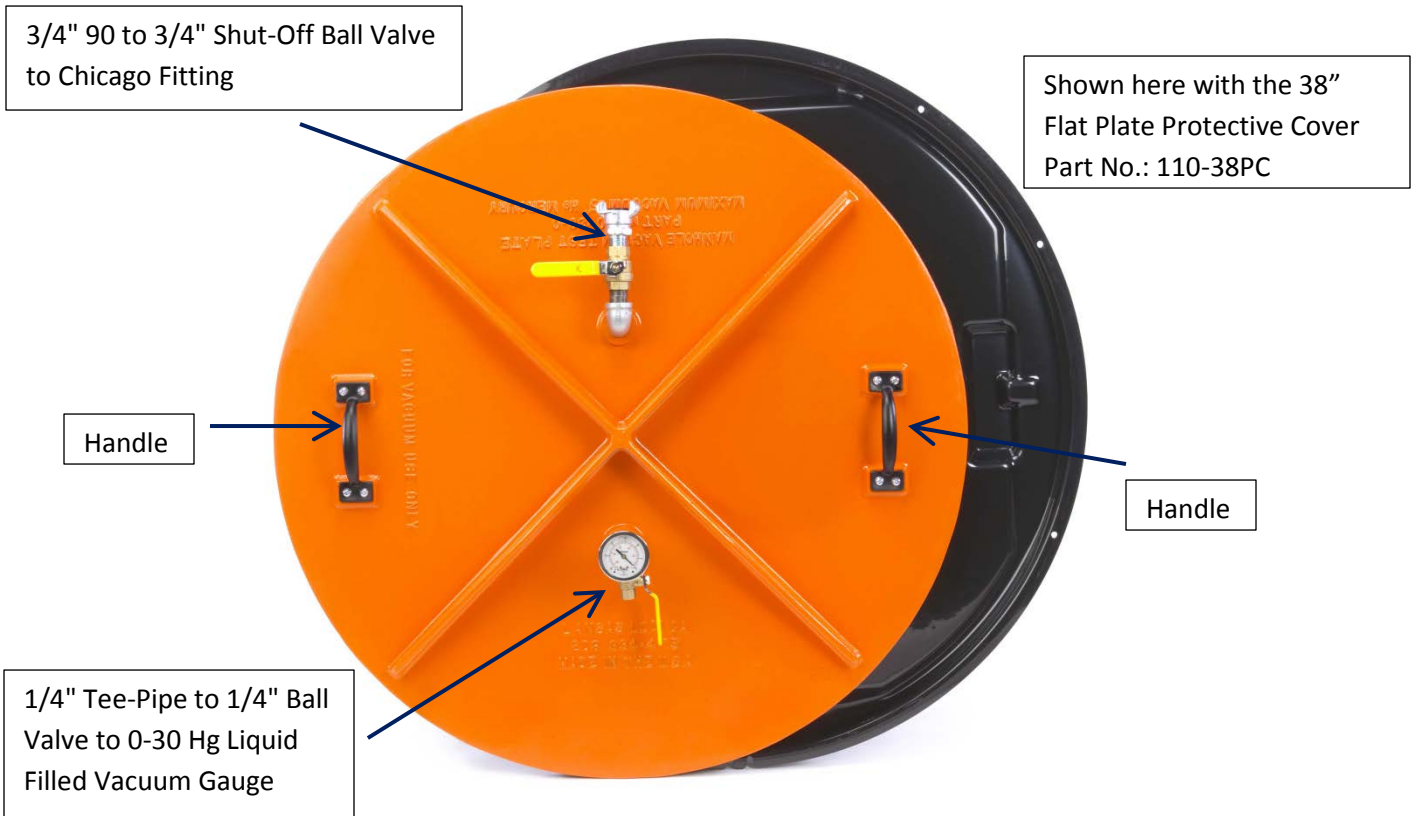




Description: Flat Plate Vacuum Test Head Assemblies

PART No.: **110-38**, 38" Flat Plate Vacuum Test Head Assembly (Range 14.0" to 34.0")

PART No.: **110-44**, 44" Flat Plate Vacuum Test Head Assembly (Range 14.0" to 40.0")



The Flat Plate Vacuum Test Head Assemblies have a 3/4" Closed Cell Foam adhered to the bottom of the plate to create the seal for completing the vacuum test. If the Closed Cell Foam becomes worn or is damaged it can be replaced with the LANSAS® Replacement Foam & Glue Kit.

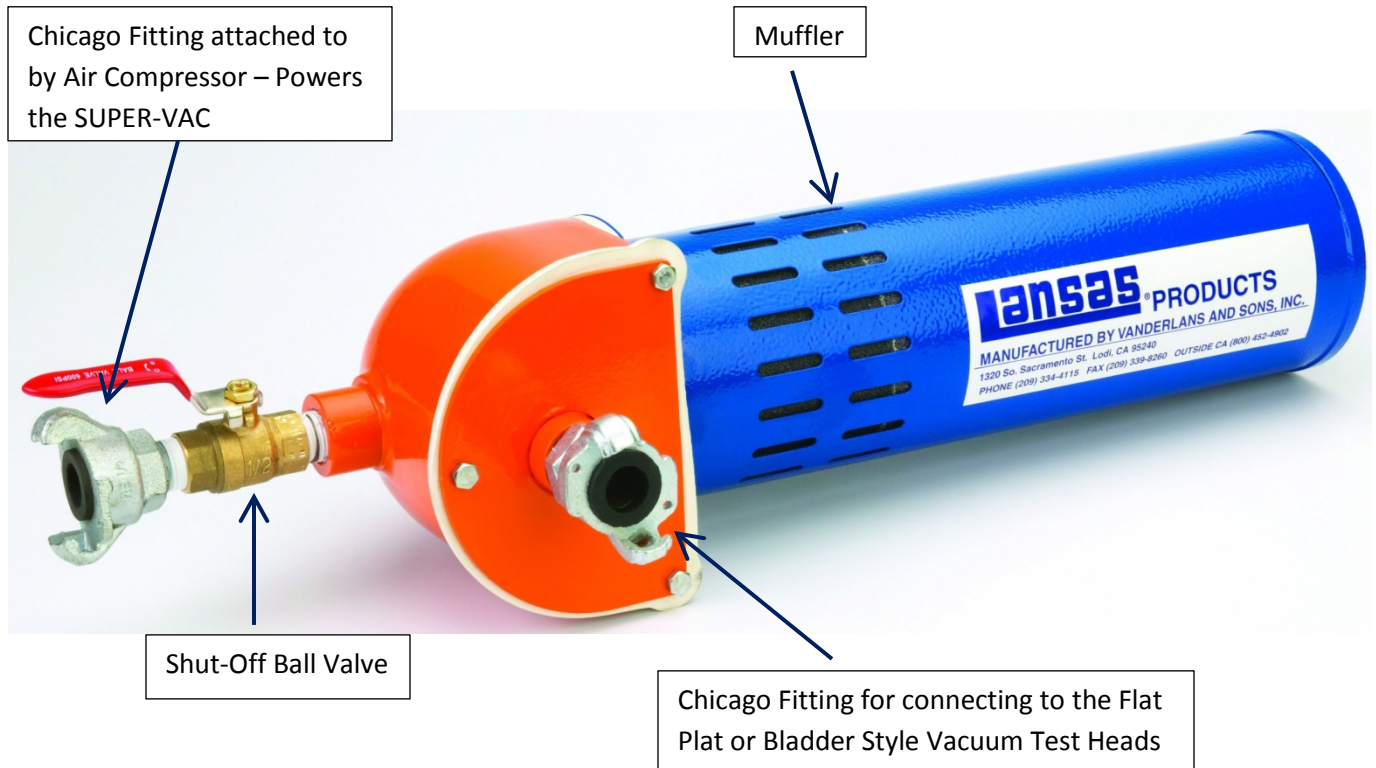
PART No.: **110-38F**, 38" Foam Pad and Glue for 38" Flat Plate Vacuum Test Head Assembly

PART No.: **110-44F**, 44" Foam Pad and Glue for 44" Flat Plate Vacuum Test Head Assembly



Description: SUPER-VAC™ (Venturi) Vacuum Generator

PART No.: 123-05, SUPER-VAC™ (Venturi) Vacuum Generator (Requires an Air Compressor that is capable of supplying a minimum of 80 CFM)



The LANSAS® SUPER-VAC™ (Venturi) Vacuum Generator is used in conjunction with your air compressor to generate the vacuum for testing manholes and pipe. The unit requires an air compressor capable of supplying a minimum of 80 CFM to function properly.



Description: SMART-BOX™ Complete Vacuum Test Kits

PART No.: **150-812**, SMART-BOX™ Complete Vacuum Test Kit (Complete with the following components.

- Part No.: **110-2127**, 21.5" – 27.5" Multi-Size Bladder Style Vacuum Test Head Assembly
- Part No.: **123-05**, SUPER-VAC™ (Venturi) Vacuum Generator
- (2) of Part No.: **050-812**, 8"x12" Multi-Size Back Plugs (Blocking)
- (2) of Part No.: **321-30**, 30 ft. Standard Inflation Kit with Gauge Assembly
- Part No.: **453-SB**, Empty SMART-BOX™ (Lockable Storage Container)

PART No.: **151-812**, SMART-BOX™ Complete Vacuum Test Kit (Complete with the following components.

- Part No.: **110-38**, 38" Flat Plate Manhole Vacuum Test Head Assembly (Range 14.0" to 34.0")
- Part No.: **123-05**, SUPER-VAC™ (Venturi) Vacuum Generator
- (2) of Part No.: **050-812**, 8"x12" Multi-Size Back Plugs (Blocking)
- (2) of Part No.: **321-30**, 30 ft. Standard Inflation Kit with Gauge Assembly
- Part No.: **453-SB**, Empty SMART-BOX™ (Lockable Storage Container)



Part No.: **150-812**



Part No.: **151-812**

The LANSAS® SMART-BOX™ Complete Manhole Vacuum Test Kits come everything you need to complete a vacuum test on a manhole with no more than two pipe inlets into the manhole and where these pipes fall into the size range of 7.0" to a maximum of 12.25" on the I.D. of those pipes and the manhole opening is in the range of 21.5" to 27.5" for the 150-812, which comes with the 21.5" – 27.5" Bladder Style Vacuum Test Head or in the range of 14.0" to 34.0" for the Part No. 151-812 which comes with the 38" Flat Plate Vacuum Test Head.



Installation of the SUPER-VAC™ (Venturi) Vacuum Generator on the Bladder Style or Flat Plate Vacuum Test Head Assemblies

Bladder Style Vacuum Test Head Assembly: The Chicago Fitting on the SUPER-VAC™ will connect directly to the Chicago Fitting supplied with the Bladder Style Vacuum Test Head so that the muffler of the SUPER-VAC™ runs horizontally to the ground. The correct fitting on the SUPER-VAC™ to connect to the Vacuum Test Head is the one *WITHOUT* the Shut-Off Ball Valve. Installing the Bladder Style Vacuum Test Heads at deeper depths may require the use of the 3/4" x 8" Extender Pipe Fitting. (Supplied with all LANSAS® Bladder Style Vacuum Test Heads)

Flat Plate Vacuum Test Head Assembly: The Chicago Fitting on the SUPER-VAC™ will connect directly to the Chicago Fitting supplied with the Bladder Style Vacuum Test Head so that the muffler of the SUPER-VAC™ runs horizontally to the ground. The correct fitting on the SUPER-VAC™ to connect to the Vacuum Test Head is the one *WITHOUT* the Shut-Off Ball Valve.



Part No.: **110-2127 & 123-05**



Part No.: **110-38 & 110-38PC**



SETTING UP THE VACUUM TEST:



CAUTION! Before entering the manhole, be sure to follow all local, state, and federal guidelines including, but not limited to Confined Space Safety Regulations.



Seal all manhole inverts. All Pipe Plugs must be Blocked or Braced! (Consult a Certified Engineer for proper Blocking or Bracing of Pipe Plugs) When performing a Vacuum Test up to 10 Hg (10 " of Mercury), use pneumatic Pipe Plugs with a Back Pressure or Test Pressure rating of a minimum of 6 psi.



Follow all the manufacturer's instructions for the safe use of Pipe Plugs.



Brace the inverts if the lines entering the manhole have not been back-filled. Inverts not braced may become dislodged and pull into the manhole.

INSTALLATION OF THE BLADDER STYLE VACUUM TEST HEAD:

Position the Bladder Style Vacuum Test Head Assembly into the top access of the manhole. Adjust the Vacuum Test Head using the adjustment Super Wing-Nut on the Support Brace Assembly so the bladder portion will seal in the vertically straight section of the manhole.

Inflating the bladder: Inflate the bladder to the Required Inflation Pressure indicated and stenciled on the Manhole Vacuum Test Head Bladder.




CAUTION! DO NOT OVER-INFLATE OR UNDER-INFLATE THE BLADDER!


INSTALLATION OF THE FLAT PLATE VACUUM TEST HEAD:

Position the Flat Plate Vacuum Test Head over the manhole opening. This should be centered over the opening. (Do not use the 38" Flat Plate on openings larger than 34.0" or the 44" Flat Plate on openings larger than 40") LANSAS® Products can CUSTOM BUILD lids for larger openings if needed. (Do not stand on any Test Head while over the opening or during a test!)

TESTING USING THE ENGINE DRIVEN VACUUM PUMP:

1. Close all valves on the Vacuum Test Head whether it is the Bladder Style or Flat Plate.
2. Attach the Engine Driven Vacuum Pump to the Vacuum Test Head using the Vacuum Hose.
3. For the Bladder Style Vacuum Test Head – Inflate the bladder to the Required Inflation Pressure according to the Manufacturer's Instructions. (Do not over-inflate or under-inflate the bladder)
4. For the Flat Plate Vacuum Test Head – Center the Flat Plate over the manhole opening. (This unit must be on the flat concrete slab or the metal frame sealed to the slab)
5. Start the Vacuum Pump Engine. Refer to the Engine Manufacturer's Operating Manual for the proper use and maintenance of the engine.
6. Once the RPM's have stabilized and the engine is warm, open the 3/4" Shut-Off Ball Valve on the Vacuum Test Head and allow the vacuum on the manhole to reach the required level according to the test specification. (Please consult the engineer, municipal agency or proper ASTM Test Standard to be certain of the test requirement)

7.  **CAUTION!** Do not exceed the Manufacturer's vacuum rating on the Bladder Style or Flat Plate Vacuum Test Head. Do not exceed 10 Hg (10" of Mercury) on any LANSAS® Flat Plate or Bladder Style Vacuum Test Head!

8.  **CAUTION!** Do not pressurize the manhole!



9. When your vacuum on the manhole reaches the required or specified test vacuum, close the 3/4" Shut-Off Ball Valve on the Vacuum Test Head.
10. Turn off the Vacuum Pump engine.
11. Monitor any vacuum loss according to your test specifications.
12. When your test is complete, open the 1/4" Ball Valve on the Vacuum Gauge assembly of your Vacuum Test Head to relieve the vacuum on the manhole.
13. After all vacuum (negative pressure) is released and the Vacuum Gauge on your Vacuum Test Head reads absolute zero, you can deflate the bladder on the Bladder Style Vacuum Test Head.

TESTING USING THE SUPER-VAC™ (VENTURI) VACUUM GENERATOR:

1. Close all valves on the Vacuum Test Head whether it is the Bladder Style or Flat Plate.
2. Attach the air compressor to the SUPER-VAC™ (Venturi) Vacuum Generator to the Chicago Fitting with the Shut-Off Ball Valve so the compressor is blowing through the length of the SUPER-VAC™.
3. For the Bladder Style Vacuum Test Head – Inflate the bladder to the Required Inflation Pressure according to the Manufacturer's Instructions. (Do not over-inflate or under-inflate the bladder)
4. For the Flat Plate Vacuum Test Head – Center the Flat Plate over the manhole opening. (This unit must be on the flat concrete slab or the metal frame sealed to the slab)
5. Open the Shut-Off Ball Valve on the SUPER-VAC™ (Venturi) Vacuum Generator to allow air to blow through the SUPER-VAC™.
6. Open the 3/4" Shut-Off Ball Valve on the Vacuum Test Head and allow the vacuum on the manhole to reach the required level according to the test specification. (Please consult the proper ASTM Test Standard to be certain of the test requirement)



7. **CAUTION!** Do not exceed the Manufacturer's vacuum rating on the Bladder Style or Flat Plate Vacuum Test Head. Do not exceed 10 Hg (10" of Mercury) on any LANSAS® Flat Plate or Bladder Style Vacuum Test Head!



8. **CAUTION!** Do not pressurize the manhole!
9. When your vacuum on the manhole reaches the required test specified vacuum, close the 3/4" Shut-Off Ball Valve on the Vacuum Test Head.
10. Turn off your air compressor.
11. Monitor any vacuum loss according to your test specifications.
12. When your test is complete, open the 1/4" Ball Valve on the Vacuum Gauge assembly of your Vacuum Test Head to relieve the vacuum on the manhole.
13. After all vacuum (negative pressure) is released and the Vacuum Gauge on your Vacuum Test Head reads absolute zero, you can deflate the bladder on the Bladder Style Vacuum Test Head.



VACUUM TESTING TROUBLE SHOOTING CHART:

Problem

Possible Solution

Can't get the Bladder to Seal

Verify that the bladder is inflated to the Required Inflation Pressure. The Inflation Pressure will be stenciled on the bladder. If you are not sure, contact the Manufacturer.

Make sure the manhole is the correct size for the range of the Vacuum Test Head.

110-2127 – Range is 21.5" to 27.5".

110-2733 – Range is 27.0" to 33.0".

110-3036 – Range is 30.0" to 36.0".

Make sure the bladder is set to seal on the flat vertical area of the manhole opening. Prior to where the cone slopes out.

Can't get the Flat Plate the Seal on the manhole.

Put pressure on the Flat Plate Vacuum Test Head to help it get a seal.

Wet the foam underside of the Flat Plate to help get a seal.

If sealing directly on the concrete slab, wet the slab to help get a seal.

Make sure there are not any creases nor damage to the the foam on the plate or debris causing a leak path.

SOAPY BUBBLE TEST:

The "SOAPY BUBBLE" test can be performed by wetting down the inside of your manhole with a soap and water solution. One way to achieve this is by siphoning soapy water from a 5 gallon bucket with a hose. Perform your Vacuum Test as per the above steps 1-13. After removing the Vacuum Test Head, inspect the manhole to see where the bubble have been created by the air being sucked into the manhole. These are your leak points.



TROUBLE SHOOTING CHART FOR ROTARY VANE PUMPS:

<u>Problem</u>	<u>Possible Cause</u>	<u>Possible Solution</u>
Low Vacuum	Filter Dirty	Clean or replace filter
	Vacuum line collapsed	Replace vacuum line
	Plugged vacuum line	Clean or replace vacuum line
	Relief valve set too low	Check and adjust relief valve
	Bad Gauge	Replace gauge
	Motor not wire correctly	Check wiring diagram and rewire
	Vanes sticking	Flush unit
	Vanes worn	Replace vanes
	Shaft seal worn	Return unit to Authorized Service Center for repair
	Poor or no lubrication	Check oil level and adjust oil level
Pump overheats	Filter dirty	Clean or replace filter
	Muffler dirty	Clean or replace muffler
	Relief valve set too high	Check and adjust relief valve
	Running at too high RPMs	Check RPM's and reduce speed
	Unit overly dirty	Clean with compressed air
	Poor or no lubrication	Check oil level and adjust oil level

To find the Gast Certified Service Center near you, please contact Gast directly or visit the Gast website for a nationwide list of service centers.

Gast Manufacturing, Inc. http://www.gastmfg.com/rep_distributors_north_america.aspx
2300 M-139 Highway Office: (269) 926-6171 Technical: (269) 934-1130
Benton Harbor, MI 49023-0019 Tech. Fax: (269) 927-0808

Maintenance:

Check the bladder before and after every use for cuts, punctures, abrasions or other damage. If any of these conditions exist, do not use the unit. Contact the Manufacturer for instructions.

Vacuum Pump Lubricant Required! You must maintain the Vacuum Pump Oil Reservoir at 2/3's full. THIS UNIT REQUIRES LUBRICATION. Use Gast #AD220 or a detergent SAE #10 automotive engine oil for lubricating. Failure to keep the Vacuum Pump properly lubricated will cause the Vacuum Pump to fail.



Please refer to the Gast Vacuum Pump Operation and Maintenance Technical Manual for the proper use and care of the Gast Vacuum Pump.

Please refer to the Engine Manufacturer's Owner's Manual for the proper care, use and maintenance of the Briggs & Stratton and Honda Engines.

Visit the respective websites for Briggs & Stratton and Honda for information on Authorized Service Centers or maintenance and use of these engines.

Briggs & Stratton Service Center Locator:

<http://www.briggsandstratton.com/us/en/support/dealerlocator>

Honda Service Center Locator:

<http://engines.honda.com/dealer-locator>

LANSAS® Products Vacuum Testing Equipment Parts List Reference:

<u>Part Number</u>	<u>Description</u>
121-00H	Engine Driven Vacuum Pump with Honda Engine
120-00	Engine Driven Vacuum Pump with Briggs & Stratton Engine
123-05	SUPER-VAC™ (Venturi) Vacuum Generator
110-2127	21.5" – 27.5" Multi-Size Bladder Style Vacuum Test Head Assembly
110-2733	27.0" – 33.0" Multi-Size Bladder Style Vacuum Test Head Assembly
110-3036	30.0" – 36.0" Multi-Size Bladder Style Vacuum Test Head Assembly
110-38	38" Flat Plate Vacuum Test Head Assembly (Range 14.0" – 34.0")
110-44	44" Flat Plate Vacuum Test Head Assembly (Range 14.0" – 40.0")
125-30	3/4" x 30 ft. Vacuum Hose Assembly
140-00	Wheel Kit Assembly
AB65C	Intake Filter Assembly (Gast Vacuum Pump)
3020-V29B	Gast Vacuum Pump
AA900E	Exhaust Muffler Assembly (Gast Vacuum Pump)
AA960-1	Oil Reservoir Assembly
121-Frame	Frame Assembly for LANSAS® Engine Driven Vacuum Pump
21-005	3/4" Chicago Fitting x 3/4" Male NPT
110-2127CB	Support Brace Assembly for Part No. 110-2127 (21.5"-27.5" Test Head)
110-2733CB	Support Brace Assembly for Part No. 110-2733 (27.0"-33.0" Test Head)
110-3036CB	Support Brace Assembly for Part No. 110-3036 (30.0"-36.0" Test Head)
110-2127B	Replacement Bladder for 21.5"-27.5" Vacuum Test Head Assembly
110-2733B	Replacement Bladder for 27.0"-33.0" Vacuum Test Head Assembly
110-3036B	Replacement Bladder for 30.0"-36.0" Vacuum Test Head Assembly
110-24B	Replacement Bladder for 24" Vacuum Test Head Assembly
110-30B	Replacement Bladder for 30" Vacuum Test Head Assembly



110-38F	Foam and Glue Kit (Foam replacement for 38" Flat Plate Assembly)
110-44F	Foam and Glue Kit (Foam replacement for 44" Flat Plate Assembly)
131-30	0-30 Hg, Liquid Filled Vacuum Gauge
21-053	1/4" Ball Valve (Dump Valve on Vacuum Gauge Assembly)
21-052	3/4" Ball Valve (Shut-Off Ball Valve on Vacuum Test Head Assemblies)
05-144	Handle Replacement for 38" and 44" Flat Plate Test Head Assemblies
110-38PC	Protective Cover for 38" Flat Plate Vacuum Test Head Assembly