Geotech Hand Pump

Installation and Operation Manual

Rev 1/25/2017 Part # 87500003

Table of Contents

DOCUMENTATION CONVENTIONS

This uses the following conventions to present information:

WARNING

An exclamation point icon indicates a **WARNING** of a situation or condition that could lead to personal injury or death. You should not proceed until you read and thoroughly understand the **WARNING** message.

CAUTION

A raised hand icon indicates **CAUTION** information that relates to a situation or condition that could lead to equipment malfunction or damage. You should not proceed until you read and thoroughly understand the **CAUTION** message.

NOTE

A note icon indicates **NOTE** information. Notes provide additional or supplementary information about an activity or concept.

TO AVOID PERSONAL INJURY AND/OR OTHER DAMAGE:

While some precautions are specified herein, and should be noted to avoid personal injury or other damage, it is not possible for these cautions to cover all conceivable ways in which service or testing might be done, or all possible hazardous consequences of each way, nor could Geotech possible know or investigate all such ways. It is therefore the responsibility of anyone using these instructions, or any Geotech product, to satisfy themselves completely that neither personal safety nor equipment safety will be jeopardized by the service method selected. Any such injury or damage is entirely the user's responsibility. This device is not to be used in any manner on the human body.

The Geotech Hand Pump is an extremely versatile service tool that can be used to test a variety of systems and perform a number of useful tasks. Almost any part or system that requires proper sealing, pressure or vacuum to operate can be tested with the Geotech Hand Pump. The pump and its accessories also transfer fluids and can aid in other tasks.

These instructions will describe the pump, give specifications, list available kits and accessories, explain how to use the pump and provide some service tips to help you keep your Geotech Hand Pump in top shape.

Section 1: System Description

Function and Theory

The Geotech Hand Pump is simple, accurate, easy-to-use, and has many applications. It consists of a pump body, movable handle, vacuum/pressure gauge, and a dual converter. The pump is easily held in your hand as shown in figure 1-1.

Figure 1-1: Geotech Hand Pump

When the handle is squeezed, either vacuum or pressure is produced, as selected with a twist of the dual converter switch. The gauge will show the vacuum level or the pressure level.

Section 2: System Operation

The Geotech Hand Pump is simple to use. In most cases, the pump is either attached directly to a component used in place of a vacuum line, or connected into a vacuum circuit with a tee connector. The pump can be operated as a test instrument in three ways.

1. When vacuum is desired for a test, the dual converter is set to “vacuum” and the movable handle of the pump is simply squeezed with the hand as in clenching a fist. Continue pumping until the desired vacuum is indicated on the gauge.

2. The hand pump can be connected into a vacuum circuit and used to measure existing amounts of vacuum, just as any vacuum gauge would be used. When used this way do not pump the handle or an incorrect readings may result.

3. The hand pump can also be used as a pressure pump by switching the dual converter to “pressure”. When the pump handle is released from the closed position, pressure is created. Additional pressure can be applied with continued manual pumping.

Transferring / Siphoning Liquids

The Geotech Hand Pump Kit and the Liquid Transfer Accessories Kit contain jar lids (for standard size and wide-mouth mason jars) and necessary pieces of plastic tubing and tubing adapters for transferring liquids from one container to another. The 2.7” (70 mm) and 3.3” (84 mm) lids make it easy to siphon fluids in small volume applications. The threaded lids will fit most standard jars and may be used with your Geotech Hand Pump to siphon gasoline, in an emergency, without the danger of swallowing the gasoline.

Siphoning Procedure

Since the Geotech Hand Pump was not designed to pump liquids through it, an intermediate receptacle must be used to prevent the liquids from reaching the pump (as shown in Figure 2-1).

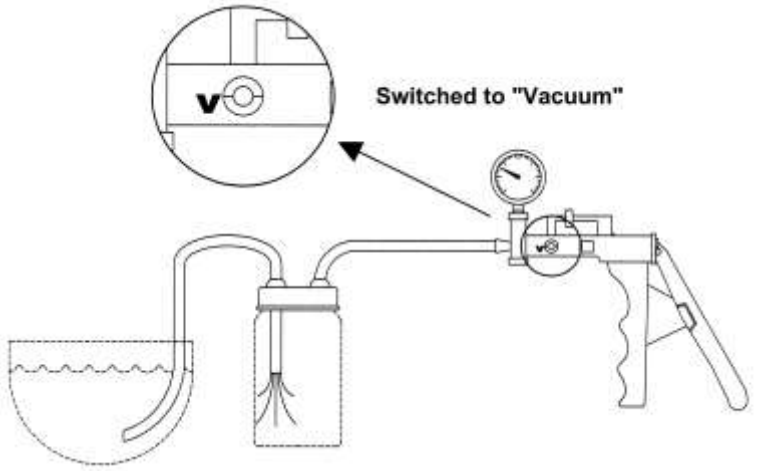

Figure 2-1: Siphoning Procedure

The siphoning procedure is simple:

1. From the kit, select a lid to fit your receptacle. Tighten the lid or ring firmly on the receptacle.

2. Connect the piece or 1/4" inside diameter (ID) tubing between the lid outlet marked “PUMP” and the Geotech Hand Pump as shown in figure 2-1.

3. Push the appropriately sized tubing through the lid until about 3” (7.6 cm) extends through. Place the other end in the liquid to be siphoned.

4. Set the dual converter switch on the pump to “V”, for “vacuum”.

5. Keep the receptacle below the level of the liquid being siphoned, and pump the Geotech Hand Pump until liquid is flowing into the receptacle. The liquid will continue to flow as long as the receptacle remains lower than the liquid being siphoned. However, continued use of the pump will speed the process.

6. When the desired amount of liquid is siphoned, remove the long tubing from the tank.

Siphoning must be stopped before the receptacle is completely filled to avoid drawing liquid into the pump.

Liquid Transfer Procedure

The liquid transfer procedure uses the pressure feature of the Geotech Hand Pump to push liquids from one container into another (as shown in Figure 2-2).

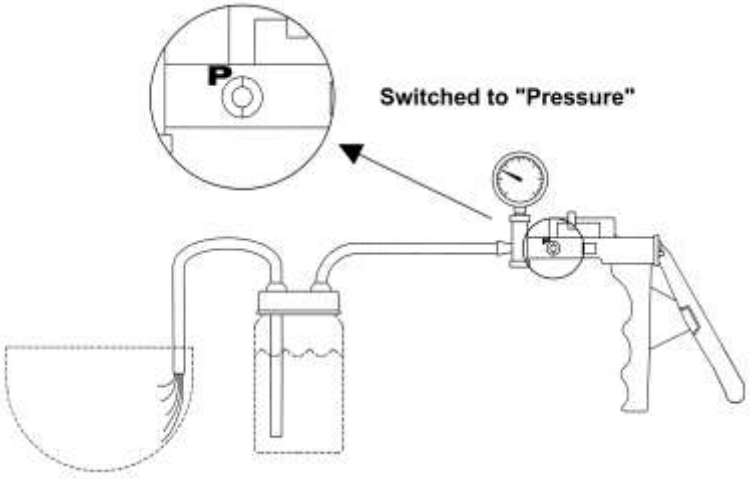

Figure 2-2: Liquid Transfer Procedure

1. From the kit, select a lid to fit your container. Tighten the lid or ring firmly on the container.

2. Connect the piece of 1/4" inside diameter (ID) tubing between the lid outlet marked “PUMP” and the Geotech Hand Pump as shown in Figure 2-2. Push the appropriately sized tubing through the lid of the container until the end of the tubing is about 1/8” to 1/4" from the bottom of the container.

3. Set the dual converter switch on the pump to “P”, for “pressure”.

4. Put the other end of this tubing into whatever container will be receiving the liquid.

5. Pump the Geotech Hand Pump until the desired amount of liquid has been transferred.

Because there will be residual pressure in the sealed container, (the container that liquid is being transferred from), slow down the pumping as the receiving container gets full, or else the fluid will overflow.

If liquid is accidentally drawn into the Geotech Hand Pump, flush the device quickly with clean warm soapy water, rinse with clean water, and dry thoroughly. Re-lubricate the pump with a non-petroleum based lubricant (silicone oil, salad oil, corn oil, etc.)

Section 3: System Maintenance

Your Geotech Hand Pump is a sturdily built, precision test instrument. However, always handle the gauge carefully. Care for your Geotech Hand Pump and it will give you years of trouble-free service.

Do not drop or handle the pump roughly as the gauge accuracy may be affected. Do not lay the gauge on a hot surface or expose it to direct flame.

Lubrication

The factory-installed lubricant is silicone oil and should provide very long service. If you find it necessary to lubricate your pump, you may also use DOT 5 (not DOT 3) silicone-based brake fluid or a basic vegetable oil such as Mazola or Crisco.

Do not use petroleum based fluids or spray lubricants such as WD-40, motor oil, etc. as these will DAMAGE the pump.

Section 4: System Troubleshooting

Problem
Unit becomes difficult to operate.

Solution
Clean and re-lubricate as necessary. See *Section 3: System Maintenance*.

Problem
Unable to build up vacuum or pressure.

Solution
Check tubing and tubing connections for leaks.

Section 5: System Specifications

Maximum vacuum at sea level	25” Hg
Stroke Volume	1 cu. In. (16 ml)
Maximum Pressure	30 PSI (2 bar)
Gauge accuracy	± 2%

Geotech Hand Pump Pressure Unit Conversion Factors

Multiply the **known** unit by the conversion factor for the **desired** unit

KNOWN → / DESIRED ↓	inches of mercury ("Hg)	millimeters of mercury (mm Hg)	pounds per square inch (psi)	pounds per square foot (psf)	inches of water ("H2O)	feet of water (ft H2O)	millibars (mb)	kiloPascals (kPa)	atmosphere (A or Atm)	kilograms per sq. meter (kg/m2)
inches of mercury	1.000	0.039	2.036	0.014	0.074	0.883	0.030	0.295	28.920	0.0029
millimeters of mercury	25.400	1.000	51.712	0.359	1.870	22.445	0.750	7.498	760.000	0.736
pounds per square inch	0.491	0.019	1.000	0.069	0.036	0.434	0.015	0.145	14.696	0.0014
pounds per square foot	70.733	2.785	144.000	1.000	5.209	62.430	2.088	20.880	2116.325	0.2048
inches of water	13.580	0.535	27.648	0.192	1.000	12.000	0.401	4.009	406.314	0.0394
feet of water	1.133	0.045	2.307	0.016	0.083	1.000	0.033	0.334	33.950	0.0033
millibars	33.864	1.333	68.943	0.479	2.494	29.920	1.000	10.000	1013.250	0.0981
kiloPascals	3.381	0.133	6.883	0.048	0.249	2.987	0.100	1.000	101.325	0.0098
atmosphere	0.033	0.001	0.068	0.0005	0.002	0.030	0.001	0.010	1.000	0.0001
kilograms per sq. meter	345.300	1360.000	703.100	4.882	25.400	304.800	10.193	101.931	10333.000	1.0000

Note: While Geotech believes these factors to be correct, we make no warranty as to the accuracy or applicability. To use chart find column for "known" measurement. Go down the column to the row wanted. Multiply the amount of the known measurement by the factor given in the chart to get the wanted number.

Figure 5-1: Unit Conversion Table

Section 6: Replacement Parts List

Parts Description	Parts List
PUMP,HAND,PLASTIC,W/5FT TUBING	87500001
PUMP,HAND,METAL,W/5FT TUBING	87500002
TUBING,VINYL,1/4x3/8,FT	87050513
KIT,TRANSFER,PFA,1/4" PORTS 1 LITER,COMPRESSION	77500001
KIT,TRANSFER,PFA,3/8" PORTS 1 LITER,COMMPRESSION	77500002

Document Revisions		
EDCF/Project #	**Description**	**Rev. Date**
#1537	Warranty change	1/25/2017

The Warranty

For a period of thirty (30) days from date of first sale, product is warranted to be free from defects in materials and workmanship. Geotech agrees to repair or replace, at Geotech's option, the portion proving defective, or at our option to refund the purchase price thereof. Geotech will have no warranty obligation if the product is subjected to abnormal operating conditions, accident, abuse, misuse, unauthorized modification, alteration, repair, or replacement of wear parts. User assumes all other risk, if any, including the risk of injury, loss, or damage, direct or consequential, arising out of the use, misuse, or inability to use this product. User agrees to use, maintain and install product in accordance with recommendations and instructions. User is responsible for transportation charges connected to the repair or replacement of product under this warranty.

Equipment Return Policy

A Return Material Authorization number (RMA #) is required prior to return of any equipment to our facilities, please call our 800 number for appropriate location. An RMA # will be issued upon receipt of your request to return equipment, which should include reasons for the return. Your return shipment to us must have this RMA # clearly marked on the outside of the package. Proof of date of purchase is required for processing of all warranty requests.

This policy applies to both equipment sales and repair orders.

FOR A RETURN MATERIAL AUTHORIZATION, PLEASE CALL OUR SERVICE DEPARTMENT AT 1-800-833-7958.

Model Number: _____

Serial Number: _____

Date of Purchase: _____

Equipment Decontamination

Prior to return, all equipment must be thoroughly cleaned and decontaminated. Please make note on RMA form, the use of equipment, contaminants equipment was exposed to, and decontamination solutions/methods used. Geotech reserves the right to refuse any equipment not properly decontaminated. Geotech may also choose to decontaminate the equipment for a fee, which will be applied to the repair order invoice

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