



Diaphragm and Piston Pumps

Installation / Operation / Parts

Manual

(For Models 1620 and 1720 Diaphragm Pumps,
and 1420, 1520 and 1520T Piston Pumps)

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Federal Communications Commission (FCC) Warning

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

Approvals

Gasboy, Greensboro, is an ISO 9001:2000 registered facility.

Underwriters Laboratories (UL):

UL File#	Products listed with UL
MH4314	All dispensers and self-contained pumping units
MH6418	Power operated Transfer Pump Models 25, 25C, 26, 27, 28, 72, 72S, 72SP, 72X, 73 and 1820
MH7404	Hand operated Transfer Pump Models 1230 Series, 1243 Series, 1520 and 1720 Series
MH10581	Key control unit, Model GKE-B Series Card reader terminals, Models 1000, 1000P Site controller, Model 2000S CFN Series Data entry terminals, Model TPK-900 Series Fuel Point Reader System

New York City Fire Department (NYFD):

NYFD C of A #	Product
4823	9100A, 9140A, 9152A, 9153A, 9800A, 9840A, 9850A, 9852A, 9853A, 9140
4997	9822A, 9823A
5046	9100Q, 9140Q, 9152Q, 9153Q, 9800Q, 9840Q, 9852Q, 9853Q
5087	8753K, 8853K, 9153K, 9853K (restricted to diesel and non-retail gasoline sales)

California Air Resources Board (CARB):

Executive Order #	Product
G-70-52-AM	Balance Vapor Recovery
G-70-150-AE	VaporVac

National Conference of Weights and Measures (NCWM) - Certificate of Compliance (CoC):

Gasboy pumps and dispensers are evaluated by NCWM under the National Type Evaluation Program (NTEP). NCWM has issued the following CoC:

CoC#	Product	Model #	CoC#	Product	Model #	CoC#	Product	Model #
95-179A2	Dispenser	9100 Retail Series, 8700 Series, 9700 Series	91-019A2	Dispenser	9100 Commercial Series			
95-136A5	Dispenser	9800 Series	91-057A3	Controller	1000 Series FMS, 2000S-CFN Series			

Patents

Gasboy products are manufactured or sold under one or more of the following US patents:

Dispensers

5,257,720

Point of Sale/Back Office Equipment

D335,673

Additional US and foreign patents pending.

Trademarks

Non-registered trademarks

Atlas™
Console™
Infinity™

Registered trademarks

ASTRA®
Fuel Point®
Gasboy®
Keytrol®
Slimline®

Additional US and foreign trademarks pending.

Other brand or product names shown may be trademarks or registered trademarks of their respective holders.

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1 – Introduction

Purpose

This document provides instructions for installation, operation, service and the parts list for Gasboy Diaphragm pump models 1620 and 1720, and Piston pump models 1420, 1520 and 1520T.

Features

General Description

Gasboy Diaphragm and Piston pumps are hand-operated heavy-duty pumps designed for fast transfer of petroleum-based liquids from standard size drums (16 to 55 gallon), truck tanks, skid or underground tanks.

Note: If pumps are used to pump flammables, such as gasoline, a UL®-listed model is required.

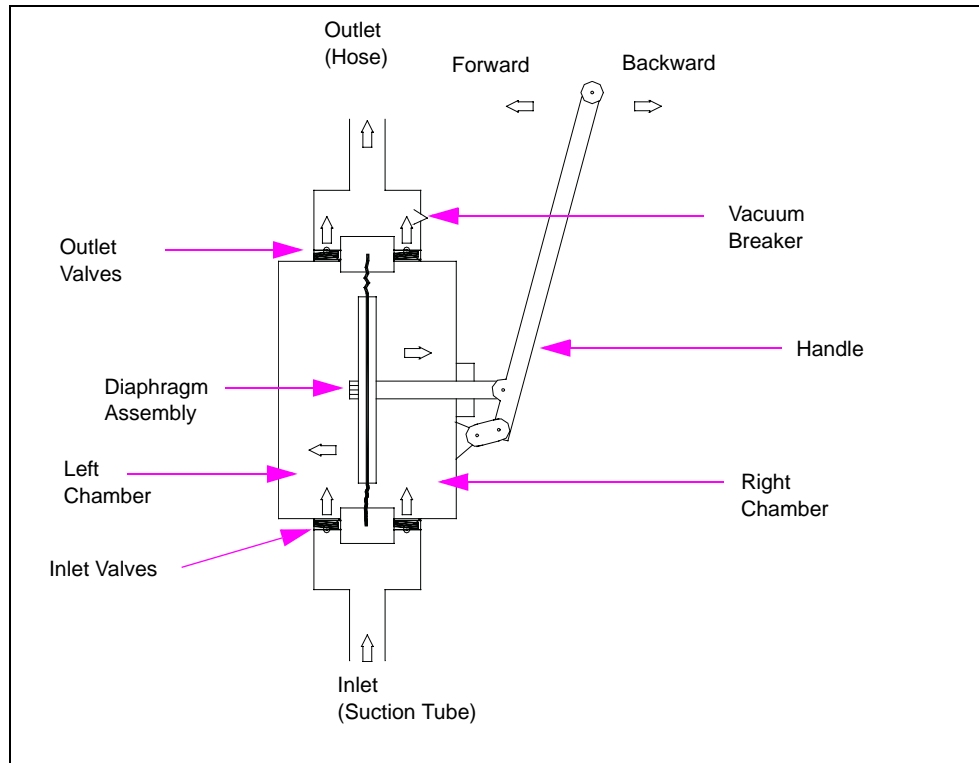
Diaphragm pumps include Gasboy models 1620 (unpainted) and 1720 (painted). Piston pumps include Gasboy models 1420 (unpainted), 1520, and 1520T (both painted). Both pump types have the same general features. However, Piston and Diaphragm pumps differ internally and each model is supplied with different components.

Features common to both pump types include:

- Push-pull handle with handle locking device
- Adjustable suction tube
- Cast aluminum housing
- Delivery rate of approximately 0.1 gallon per stroke (0.2 gallon per complete cycle)
- One-piece spring-loaded valve assembly of thermoplastic or molded Teflon with stainless steel springs.
- For the 1520T model, cover seals, inlet and outlet fitting seals, and shaft seals are made of chemically inert Teflon. Piston cups are a Teflon compound. Internal parts are stainless steel or aluminum.
- Diaphragm of tough Buna-N, nylon reinforced, supported by heavy gauge steel plate
- Self-venting adjustable bung adapter. Speeds simple installation and removal of pump to any radial position (360°).
- Built-in strainer and vacuum breaker
- Easy to install and remove for fast changeover to another tank or drum

Note: Where indicated, the delivery hose must be equipped with a static wire.

Operating Instructions



Gasboy's Diaphragm pump is double-action, that is, it pumps fluid on both the forward and backward stroke. The Diaphragm pump has four valves - two inlet valves and two outlet valves. Each valve is hooked to a spring which holds the valve to its seat.

The diaphragm itself divides the pump body into two chambers (left and right). Each chamber has two parts, one for the inlet valve and one for the outlet valve.

When the pump handle is pushed forward, the diaphragm shifts to the left chamber. This action closes the left inlet valve and simultaneously opens the left outlet valve forcing liquid in the chamber to flow through the outlet valve into the discharge hose. At the same time, in the right chamber, the inlet valve opens and liquid from the drum or tank is drawn into the right chamber.

Note: Initially, no liquid will be discharged at the hose because the pump has to be operated several times for priming.

When the handle is pulled outward, the diaphragm shifts to the right chamber. The liquid in the right chamber is forced out of the outlet valve and liquid from the drum is drawn into the left chamber.

As liquid flows in the hose, an automatic vacuum breaker (installed in the exhaust fitting of the pump) opens to atmospheric pressure to speed up hose drainage.

 WARNING

Gasboy hand-operated pumps utilize an open type nozzle. When fuel is added to an empty storage tank, fuel trapped in the pump may be displaced by the air trapped in the pump suction tube and may cause a spill. To prevent a spill, raise the nozzle above the height of the pump until all air is purged from the piping.

Warranty

For information on warranty, refer to MDE-4255 Gasboy's Warranty Policy Statement. If you have any warranty-related questions, contact Gasboy's Warranty Department at its Greensboro location.

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2 – Important Safety Information

This section introduces the hazards and safety precautions associated with installing, inspecting, maintaining or servicing this product. Before performing any task on this product, read this safety information and the applicable sections in this manual, where additional hazards and safety precautions for your task will be found. Fire, explosion, electrical shock or pressure release could occur and cause death or serious injury if these safe service procedures are not followed.



Preliminary Precautions

You are working in a potentially dangerous environment of flammable fuels, vapors, and high voltage or pressures. Only trained or authorized individuals knowledgeable in the related procedures should install, inspect, maintain or service this equipment.



Emergency Total Electrical Shut-Off

The first and most important information you must know is how to stop all fuel flow to the pump and island. Locate the switch or circuit breakers that shut-off all power to all fueling equipment, dispensing devices, and submerged turbine pumps (STPs).

⚠ WARNING	
	The EMERGENCY STOP, ALL STOP, and PUMP STOP buttons at the cashier's station WILL NOT shut off electrical power to the pump/dispenser.
	This means that even if you activate these stops, fuel may continue to flow uncontrolled.
You must use the TOTAL ELECTRICAL SHUT-OFF in the case of an emergency and not only these cashier station "stops."	

Total Electrical Shut-Off Before Access

Any procedure requiring access to electrical components or the electronics of the dispenser requires total electrical shut-off of that unit. Know the function and location of this switch or circuit breaker before inspecting, installing, maintaining, or servicing Gasboy equipment.

Evacuation, Barricading and Shut-Off

Any procedures requiring accessing the pump/dispenser or STPs requires the following three actions:



- An evacuation of all unauthorized persons and vehicles using safety tape, cones or barricades to the effected units
- A total electrical shut-off of that unit

Read the Manual

Read, understand and follow this manual and any other labels or related materials supplied with this equipment. If you do not understand a procedure, call the Gasboy Customer Service at 1-800-444-5579, Tech Support 1-800-444-5529. It is imperative to your safety and the safety of others to understand the procedures before beginning work.

Follow the Regulations

There is applicable information in NFPA 30A; *Automotive and Marine Service Code*, NFPA 70; *National Electrical Code (NEC)*, OSHA regulations and federal, state, and local codes which must be followed. Failure to install, inspect, maintain or service this equipment in accordance with these codes, regulations and standards may lead to legal citations with penalties or affect the safe use and operation of the equipment.

Replacement Parts

Use only genuine Gasboy replacement parts and retrofit kits on your pump/dispenser. Using parts other than genuine Gasboy replacement parts could create a safety hazard and violate local regulations.

Safety Symbols and Warning Words

This section provides important information about warning symbols and boxes.

Alert Symbol



This safety alert symbol is used in this manual and on warning labels to alert you to a precaution which must be followed to prevent potential personal safety hazards. Obey safety directives that follow this symbol to avoid possible injury or death.

Signal Words

These signal words used in this manual and on warning labels tell you the seriousness of particular safety hazards. The precautions that follow must be followed to prevent death, injury or damage to the equipment



DANGER - This signal word is used to alert you to a hazard to unsafe practice which will result in death or serious injury



WARNING - This alerts you to a hazard or unsafe practice that could result in death or serious injury.



CAUTION with Alert symbol - This signal word designates a hazard or unsafe practice which may result in minor injury.

CAUTION without Alert symbol - When used by itself, CAUTION designates a hazard or unsafe practice which may result in property or equipment damage.

Working With Fuels and Electrical Energy

Prevent Explosions and Fires

Fuels and their vapors will become explosive if ignited. Spilled or leaking fuels cause vapors. Even filling customer tanks will cause explosive vapors in the vicinity of dispenser or island.

Important Safety Information

No Open Flames



Open flames from matches, lighters, welding torches or other sources can ignite fuels and their vapors.



No Sparks - No Smoking

Sparks from starting vehicles, starting or using power tools, burning cigarettes, cigars or pipes can also ignite fuels and their vapors. Static electricity, including an electrostatic charge on your body, can cause a spark sufficient to ignite fuels and their vapors. After getting out of a vehicle, touch the metal of your vehicle to discharge any electrostatic charge before you approach the dispenser island.

Working Alone

It is highly recommended that someone who is capable of rendering first aid be present during servicing. Be familiar with Cardiopulmonary Resuscitation (CPR) methods if you are working with or around high voltages. This information is available from the American Red Cross. Always advise the station personnel about where you will be working, and caution them not to activate power while you are working on the equipment. Use the OSHA tag out and lock out procedures. If you are not familiar with this requirement, refer to information in the service manual and OSHA documentation.

Working With Electricity Safely

Be sure to use safe and established practices in working with electrical devices. Poorly wired devices may cause a fire, explosion or electrical shock. Be sure grounding connections are properly made. Make sure that sealing devices and compounds are in place. Be sure not to pinch wires when replacing covers. Follow OSHA Lock-Out and Tag-Out requirements. Station employees and service contractors need to understand and comply with this program completely to ensure safety while the equipment is down.

Hazardous Materials

Some materials present inside electronic enclosures may present a health hazard if not handled correctly. Be sure to clean hands after handling equipment. Do not place any equipment in mouth.

WARNING

This area contains a chemical known to the State of California to cause cancer.

WARNING

This area contains a chemical known to the State of California to cause birth defects or other reproductive harm.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

Emergency First Aid

Informing Emergency Personnel

Compile the following information for emergency personnel: Location of accident (for example, address, front/back of building, and so on.)

Nature of accident (for example, possible heart attack, run over by car, burns, and so on.)

Age of victim (for example, baby, teenager, middle-age, elderly)

Whether or not victim has received first aid (for example, stopped bleeding by pressure, and so on.)

Whether or not a victim has vomited (for example, if swallowed or inhaled something, and so on.)

WARNING



Gasoline ingested may cause unconsciousness and burns to internal organs.

Do not induce vomiting.

Keep airway open.

Oxygen may be needed at scene.

Seek medical advice immediately.

WARNING



Gasoline inhaled may cause unconsciousness and burns to lips, mouth and lungs.

Keep airway open.

Seek medical advice immediately.

WARNING



Gasoline spilled in eyes may cause burns to eye tissue.

Irrigate eyes with water for approximately 15 minutes.

Seek medical advice immediately

WARNING



Gasoline spilled on skin may cause burns.

Wash area thoroughly with clear/water.

Seek medical advice immediately.

IMPORTANT: Oxygen may be needed at scene if gasoline has been ingested or inhaled. Seek medical advice immediately.

Lockout/Tagout

Lockout/Tagout covers servicing and maintenance of Machines and equipment in which the unexpected energization or start up of the machine(s) or equipment or release of stored energy could cause injury to employees or personnel. Lockout/Tagout applies to all mechanical, hydraulic, chemical or other energy, but does not cover electrical hazards. Reference Subpart S of 29 CFR Part 1910 - Electrical Hazards, 29 CFR Part 1910.333 contains specific Lockout/Tagout provision for electrical hazards.

3 – Installation

Installation Precautions

All tanks and installations must conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, NFPA 70, NFPA 30, and Automotive and Marine Service Station Code (NFPA 30A) codes and regulations.

Plan your installation carefully. Dispensing troubles, which seem to be pump-related, are frequently traced to faulty installation. Review the following list of installation DOs and DONTs to avoid potential problems:

- DO read the “[Important Safety Information](#)” on page 5. It contains important information regarding the safe usage of your pumps.
- DO have the pump installed by a competent installer.
- DO NOT experiment with a pump if you are not sure the installation is correct.
- DO NOT install any underground piping without proper swing joints (always use shoulder nipples, never close nipples).
- DO NOT cover any lines until they have been both air and liquid-tested.
- DO NOT back-fill the tank or supply line with cinders or ashes (back-fill with clean sand, crushed rock, or pea gravel).
- DO NOT use black iron pipe or fittings for underground installations (use only new galvanized or fiberglass pipe and fittings).
Note: Install all fiberglass pipe and fittings according to manufacturer's specifications and requirements.
- DO NOT install the fill pipe to the tank where it can be submerged with standing water.

Suction Tube and Underground Tank Piping

If you are using an underground tank, pitch the tank away from the suction end. Horizontal runs of suction line should slope down from the pump towards the tank.

Suction lifting capabilities vary depending upon fluid and pump model. Do not exceed the lifting capabilities provided in the following table:

Model	Max Lift (Ft.) Gasoline	Max Lift (Ft.) Diesel
Diaphragm (1620, 1720)	12	13
Piston (1420, 1520)	12	13
Piston (1520T)	10	11

If your suction pipe is flat cut, the end of the suction pipe must be at least 3 inches from the bottom of the tank. If the end of your suction pipe is cut at a 45° angle, it can rest at the bottom of the tank.

The tank or piping should not be located under traffic areas. Swing joints (two ells) will prevent damage to piping due to frost heave or ground settlement.

Use non-hardening, gasoline-resistant pipe compound on male threads of all pipe joints for liquid handling piping.

Installing the Suction Tube on a Drum or Barrel

To install the suction tube on a drum or barrel, proceed as follows:

- 1 Apply pipe compound on the threads of the sliding suction tube and connect it to the inlet fitting of the pump. Extend the suction tube a little longer than necessary for the height of the drum or tank. The tube will automatically adjust to proper position when installed.
- 2 Insert the tube into the drum or tank.
- 3 Turn the bung adapter clockwise until snug against gasket and drum for a watertight connection.
- 4 Proceed to [“Installing the Bung Adaptor” on page 9](#).

Installing the Suction Tube on an Aboveground (Skid) Tank

To install the suction tube on an Aboveground (Skid) tank, proceed as follows:

- 1 Obtain sufficient length of 1" pipe to reach the bottom of the tank. Measure the distance from the bottom of the tank to the top of the adapter (subtract 3 inches to keep the end of the tube off the bottom of the tank. If required, see [“Suction Tube and Underground Tank Piping” on page 7](#)).
- 2 Apply pipe compound on the threads of the suction tube and connect it to the inlet fitting of the pump. Extend the suction tube a little longer than necessary for the height of the tank. The tube will automatically adjust to proper position when installed.
- 3 Insert the tube into the tank.
- 4 Turn the bung adapter clockwise until it is snug against the gasket and tank, for a watertight connection.
- 5 Proceed to [“Installing the Bung Adaptor” on page 9](#).

Installation on an Underground Tank - Pedestal Mount

Foundation

Foundation should be cement. After placing the pump on cement, fasten lag bolts loosely. They should not be tightened until the end of the installation.

Piping

Use only new galvanized or fiberglass pipe and fittings (install fiberglass pipe and fittings according to manufacturer's specifications and requirements). Ensure that all threads are properly cut. Each end of the pipe must be reamed out and the insides washed out with solvent to ensure cleanliness. Wash all lubricating oil off the threads of the pump. Use a good grade of gasoline-resistant sealing compound on all pipe joints.

Installing the Bung Adaptor

To install the bung adaptor, proceed as follows:

- 1 Screw the bung adaptor into the tank or drum opening and tighten by hand.
- 2 Insert the pump into the hole in the bung adaptor and line up one of the screws of the adapter with the slot in the back of the pump intake and tighten this screw to secure the pump.
- 3 Tighten the adapter using the pump for a hand hold.
- 4 If the pump is not in a desirable position, back out the screw from the slot and turn the pump to a desirable position. Do not loosen the bung adapter.
- 5 When the desired position is attained, tighten all three screws of the adapter to hold the pump securely in place. The screw inserted into the slot in step 2 is no longer needed.

Attaching the Hose and Nozzle

To attach the hose and nozzle, proceed as follows:

- 1 Screw the hose into the product outlet on top or on the side of the pump. Apply gasoline-resistant pipe compound to male threads.
- 2 Screw the nozzle onto the hose.

Attaching the Meter Register

A meter register is optional. If used, it must be mounted on a vertical riser coming out of the pump. In some cases, it may be necessary to change the location of the pump outlet to obtain a vertical discharge. If the pump does not have a nozzle equipped with a hook, Gasboy nozzle part number 003785 can be substituted and will hang up in the hose drain valve body of the meter register.

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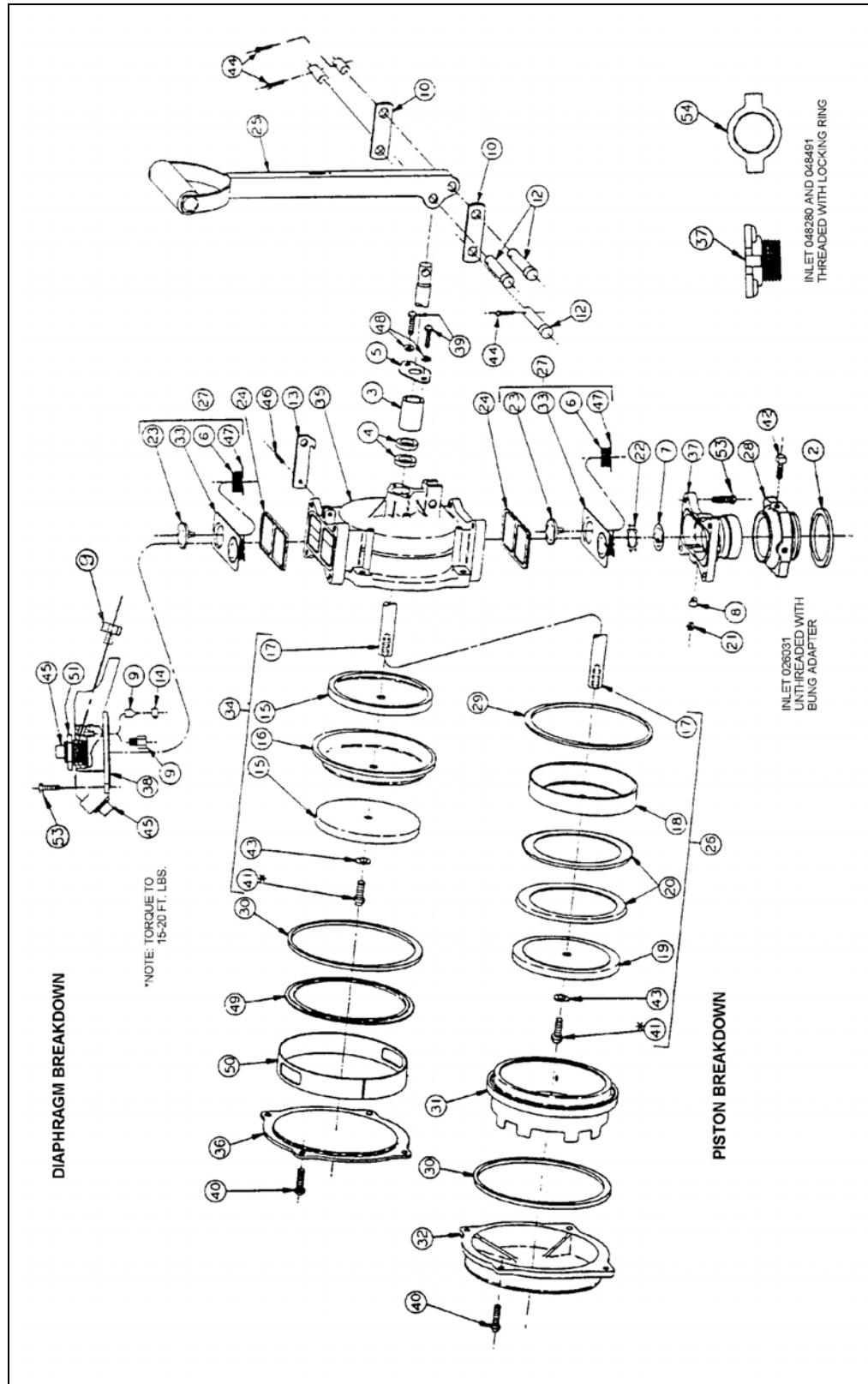
4 – Parts and Service

When your Pump Needs Service

When your pump needs service, follow these guidelines:

- Procedures requiring disassembly of portions of the pump should be performed by competent service personnel. Gasboy has a distributor network which services fuel dispensing equipment in every part of the country.
- Replace worn, rusted, or corroded parts immediately with new authorized service parts supplied by Gasboy. Replacing parts with incorrect or substandard substitutes will result in unsatisfactory pump operation. Always use new gaskets or seals when servicing or rebuilding Gasboy equipment; do not reuse old ones.

The following pages list parts and service procedures for the Diaphragm and Piston pumps. Using part numbers when ordering will expedite your order and reduce the possibility of the wrong parts being shipped.



Diaphragm and Piston Pump Parts

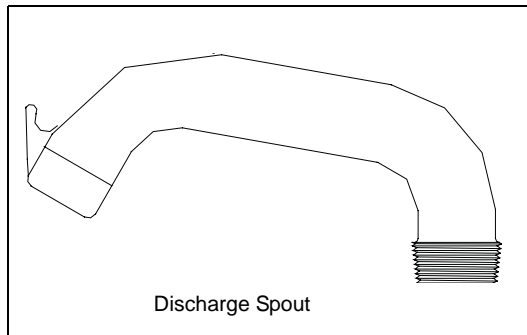
Item	Part Number	Description
2	027367	Gasket (Bung Adapter)
3	048252	Bearing
4	048249	Packing
	040046	Packing, 1520T
5	048254	Bearing Plate
6	048285	Valve Spring
7	048260	Suction Screen
	051616	Suction Screen, 1520T
8	048253	Fire Screen
	051613	Fire Screen, 1520T
9	048266	Vacuum Breaker (Production prior to 2/27/98)
	066570	Vacuum Breaker (Production 2/27/98 or later)
	066527	Vacuum Breaker, 1520T
10	034916	Connecting Link
12	043020	Pin 1-15/32" long
13	020641	Clasp
14	048264	Retainer (except 1520T)
15	048271	Diaphragm Retainer
16	048272	Diaphragm
17	048270	Shaft
	055895	Shaft (Piston pumps only)
18	045662	Piston Retainer
	045660	Piston Retainer, 1520T
19	045663	Piston Retainer
	045661	Piston Retainer, 1520T
20	045705	Piston Cup (Piston pumps only)
21	048297	Push-On Ring
	049531	Push-On Ring, 1520T
22	048287	Push-On Ring
	049532	Push-On Ring, 1520T
23	048288	Valve
	066941	Valve, 1520T
24	048289	Valve Gasket
	054150	Small Valve Seal, 1520T
	054151	Large Valve Seal, 1520T
25	029398	Handle and Grip Assy.
26	045701	Piston Assembly
	045702	Piston Assembly, 1520T

Item	Part Number	Description
27	048278	Valve Assembly
	066942	Valve Assembly, 1520T
28	026116	Bung Adapter Assembly
29	027368	Ring - Square Cut
	054092	Seal Ring Assembly, 1520T
30	048243	Ring - Square Cut
	054086	Cover Seal, 1520T
31	003927	Piston Cylinder (Piston pumps only)
32	003506	Piston Cover
33	048247	Valve Plate
34	048273	Diaphragm Assembly
35	048911	Pump Body
36	048245	Cover
37	026031	Inlet Fitting, 1" FNPT used w/Bung Adapter
	048280	Inlet Fitting, 1" FNPT x 2" MNPT with vent hole
	048491	Inlet Fitting, 1" FNPT x 2" MNPT without vent hole
38	026032	Fitting, 1" vertical outlet
	026056	Fitting, 1" vertical outlet, 1520T
	048267	Fitting, 3/4" side outlet <i>Note: Outlet fittings also require items 9 and 14 to prevent leakage</i>
39	K85736 53	1/4-20 x 1 Lg Hex Hd Thread Forming Screw
40	K85736 53	1/4-20 x 1 Lg Hex Hd Thread Forming Screw
41	051981	3/8-24 x 3/4 Lg Self-locking Screw
	051977	3/8-24 x 7/8 Lg Self-locking Screw, 1520T
42	053245	1/4-20 x 3/4 Lg Sq Hd Cup Pt Set Screw
43	068044	3/8 Lock washer
	068936	3/8 Lock washer
44	K02125	3/32 x 3/4 Lg Cotter Pin
45	K02309C07	Pipe Plug, 3/4"
46	043261	3/16 Dia x 1/2 Lg Roll Pin
47	048286	Spring Retainer
48	068155	1/4 Lock Washer
49	048244	Diaphragm Washer
50	048246	Diaphragm Ring
51	K68053	Bushing - Hexagon, 1520T
53	K85736 53	1/4-20 x 1 Lg Hex Hd Thread Forming Screw
54	039163	Locking Ring

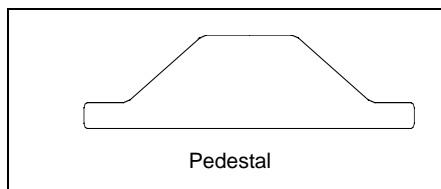
Accessories for Diaphragm and Piston Pumps

Part Number	Description
064895	Sliding Suction, Polyethylene
M03681A002	Sliding Suction, Alum.
066110	Sliding Suction, Alum., 1520T
030550	5/8" x 8' Hose (Std.)
030530	5/8" x 8' Hose (UL-approved)
000785	Nozzle (Regular, Manual)
000784	Nozzle (Unleaded, Manual)
038455	Nozzle (Regular, automatic)
032694	Repair Kit - Diaphragm
032695	Repair Kit - Piston
032696	Repair Kit - Piston (1520T)

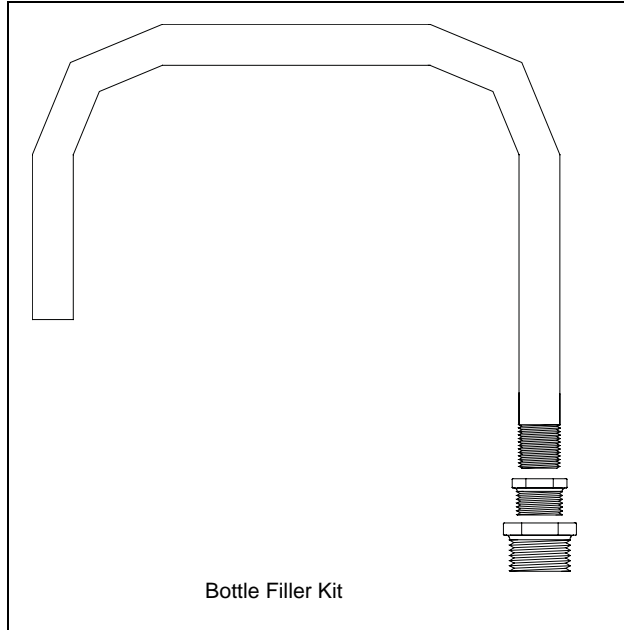
Part Number	Description
03855	Discharge Spout



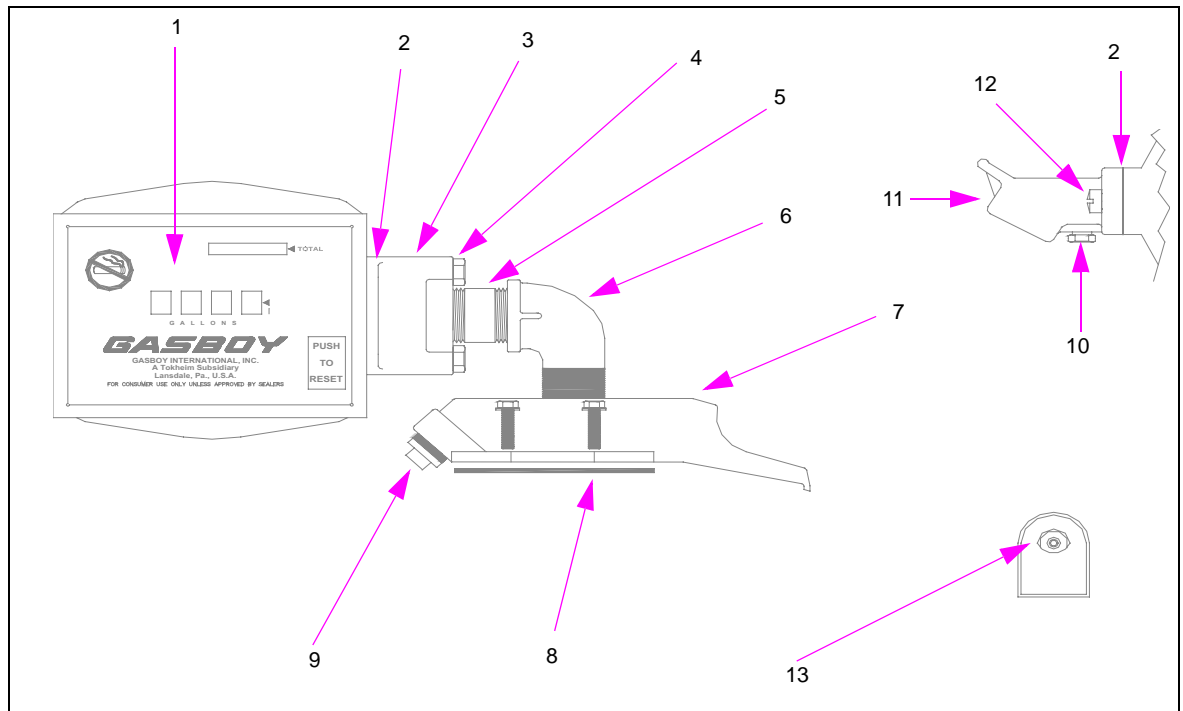
Part Number	Description
003924	Pedestal only (casting)



Part Number	Description
049495	Bottle Filler Kit



Meter-Register Conversion Kit



The following table lists the part numbers and descriptions for Meter-Register Conversion Kits, 035624 (US Gas & Diesel), 035629 (Liter Gas & Diesel) and 035628 (Imperial Gas & Diesel).

Item	Part Number	Description
1	036341	Meter-Register, 4860P-40, US Gal. Gas & Diesel
	036343	Meter-Register, 4860P-44, Liter Gas & Diesel
	036345	Meter-Register, 4860P-52, Imperial Gas & Diesel
2	M05618B001	Gasket, Inlet/Outlet
3	003650	Flange
4	K05350	Screw Hex HD CAP 3/8-16 x 3-3/4 Lg
5	R11935 20	Pipe TBE, 1 x 1-1/2 Close Nip
6	K02321 20	Elbow, Street 1 x 90
7	026032	Adapter-Spout
8	048289	Valve Gasket
9	K02282	Plug Pipe, Sq. Hd
10	066570	Vac Breaker Assy.
11	003606	Elbow, Flange, 3/4 Dsch, Vac Breaker
12	052556	Screw, 3/8-16 x 7/8
13	047279	Plug Pipe, Soc Hd, 1/8

Disassembling the Pump

To disassemble the pump, proceed as follows:

Note: Parenthesized numbers relate to the exploded drawing of pump.

- 1 Loosen set screws (42) to disconnect the bung adapter (28), if applicable, from the inlet fitting of the pump.
- 2 Remove the pump from the drum.
- 3 Unscrew the bung adapter (28) from the drum and remove the gasket (2) from the bung adapter.
- 4 Unscrew the sliding suction tube from the inlet fitting.

Note: When reassembling, apply pipe compound on the threads of the sliding suction tube.

- 5 Disconnect the handle and grip assembly (25) from the shaft and pump body by removing three cotter pins (44), two thrust washers (1), and two connecting links (10).
- 6 Unscrew the hose from the fitting. Remove the hose from the tube.
- 7 Detach the fitting (38) from the pump body by removing four screws (53).
- 8 Disassemble the valve assembly by separating the valve (23), valve plate (33), valve spring (6), and spring retainer (47).
- 9 Detach the valve gasket (24).
- 10 Detach the vacuum breaker (9) either by removing the retainer (14, except for 1520T) or by unscrewing the external vacuum breaker (production models 2/27/98 or later).

Note: Steps 11, 12 and 13 pertain to disassembly of the diaphragm. If you are disassembling a Piston pump, resume with step 14 and follow the instructions for "Replacing Piston Cups" on page 19.

- 11 Separate the diaphragm cover (36), ring (50), and washer (49) from the pump body by removing four screws (40).
- 12 Remove the screw (41) and the lock washer (43) from the shaft.
- 13 Disassemble the diaphragm assembly by separating two diaphragm retainers (15), diaphragm (16), and shaft (17). Remove the shaft from the pump body.
- 14 Remove the square-cut ring (30).
- 15 Remove two screws (39), two lock washers (48), bearing plate (5), and two packings (4).

Note: On reassembly, apply oil to bearings and packing.

- 16 Remove four screws (53), inlet fitting (37), push-on ring (21), and suction screen (7).
- 17 Repeat steps 8 and 9.
- 18 Remove the push-on ring (21) and fire screen (8).
- 19 Clean and inspect parts for wear or damage.
- 20 Replace worn parts with new ones.
- 21 Reassemble and replace the pump into the drum by reversing steps 1 through 18.

Replacing Piston Cups

The Piston Assembly consists of:

- Two piston cups
- One shaft with drilled hole
- Two piston retainers (one with wide flange, one with narrow flange)
- One 3/8" - 24 screw
- One internal tooth lock washer

Removing Old Piston Cups

To remove old piston cups, proceed as follows:

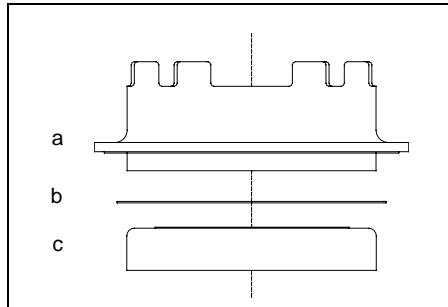
- 1 Remove cotter pin and washer securing the handle and grip assembly to the shaft. Drop the handle and grip assembly.
- 2 Remove the four hexagonal head cap screws securing the piston cover to the pump body and remove the cover. Loosen the two slotted hexagonal head machine screws on the packing plate.
- 3 Pull the piston cylinder and piston assembly from the pump body.
- 4 Remove the hexagonal head screw and lock washer which holds the piston assembly together and remove the old piston cups.

Installing New Piston Cups

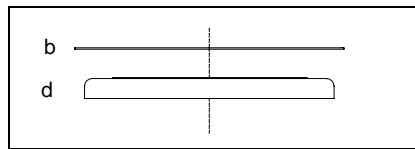
To install new piston cups, proceed as follows:

- 1 Position the piston retainer with the widest flange (c) face down on a flat surface.
- 2 Place one piston cup (b) on top of the piston retainer (c) with the opening of the cup centered with the raised portion of the retainer.

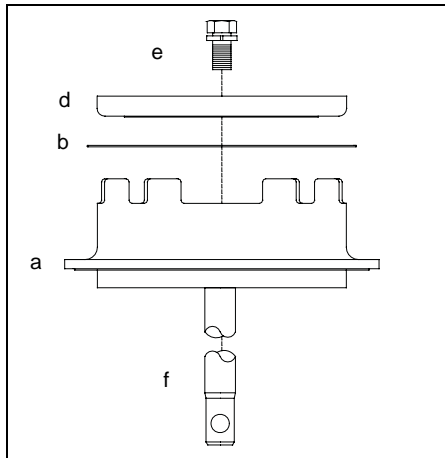
- 3 Holding the piston cylinder (a) in both hands with notched side up, press evenly onto the retainer and piston cup.



- 4 Take the piston retainer with the narrow flange (d) and position the second piston cup (b), flange down, on the retainer. Center the piston cup with the raised portion of the retainer.



- 5 Turn over, press into the cylinder and insert the lock washer and screw (e) (use Loctite™ #277) into the piston retainer (d).

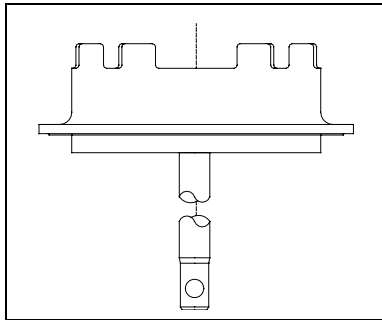


- 6 Grasp the entire assembly, turn over, and assemble the shaft (f). Tighten the screw to 15 to 20 ft. lbs. torque.

Note: When tightening the screw, hold the shaft with a drift pin or rod inserted through the shaft hole only. Do not grip the shaft in a vise, and so on, as this is a bearing surface and can result in damage to the surface.

- 7 Slide the completed assembly into the housing carefully so that the shaft does not score the bearings.

- 8 When inserting the cylinder, align the small boss on the cylinder with the guide in the body casting.
- 9 Reassemble the cylinder and piston assembly into the pump body.
- 10 Replace the cover plate with the four hexagonal head screws previously removed (see step 2 under “[Removing Old Piston Cups](#)” on page 19).
- 11 Align the hole in the shaft with the connecting links and replace the pin, washer, and cotter pin.



Repacking the Stuffing Box

The stuffing box is located on the pump illustration between the handle and the pump body. To repack the stuffing box, proceed as follows:

- 1 Remove two screws (39) and slide the bearing (3) back on the shaft (17).
- 2 Remove the old seal (4) and insert the new seal.
- 3 Push the bearing (3) against the packing.
- 4 Place the bearing plate (5) in position and tighten the screws (39).

Cleaning the Suction Screen

The suction screen is located at the pump inlet. To clean the suction screen, proceed as follows:

- 1 Remove the inlet fitting (37) by taking out screws. This will allow the removal of the valve assembly (27) and push-on ring (22).
- 2 Replace the screen (7).

~OR~

Clean the screen (7) with solvent. Dry and replace.

Changing the Diaphragm

To change the diaphragm, proceed as follows:

- 1 Separate the diaphragm cover (36), ring (50) and washer (49) from the pump body by removing four screws.
- 2 Remove the screw (41) and lock washer (43) from the shaft (17).
- 3 Disassemble the diaphragm assembly by separating two diaphragm retainers (15), diaphragm (16), and shaft (17). Remove the shaft from the pump body.
- 4 Remove the gasket (30).
- 5 When reassembling, replace the gasket with a new one.
- 6 Apply Loctite #277 to the threads of the screw and attach the lock washer. Torque to 15 to 20 ft. lbs.

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