GASBOY

Series 70 and 1800 Consumer Electric Pumps

Installation/Operation/Parts Manual

MDE-4423B
(formerly 035219)

Company Programs and Documentation

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:

U.L. File#	Products listed with U.L.
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:

NYFD 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

California Air Resources Board (CARB):

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

NCWM – Certificate of Compliance

Gasboy pumps and dispensers are evaluated by the National Conference of Weights and Measures (NCWM) under the National Type Evaluation Program (NTEP). NCWM has issued the following Certificates of Compliance (COC):

COC#	Product	Model #	COC #	Product	Model #	COC #	Product	Model #
95-179A2	Dispenser	9100 Retail S 8700 Series, 9700 Series	91-019A2	Dispenser	9100 Commercial Series			
95-136A5	Dispenser	9800 Series	91-0573A3	Dispenser	1000 Series 2000-CFN Series			

Patents

Gasboy products are manufactured or sold under one or more of the following U.S. patents:

Dispensers

5,257,720

Point of Sale/Back Office Equipment

D335,673

Trademarks

Non-registered trademarks

Atlas™
Consola™
Infinity™

Registered trademarks

ASTRA®
Fuel Point®
Gasboy®
Keytrol®
Slimline®

Additional U.S. and foreign trademarks pending.

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

Additional U.S. and foreign patents pending.

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E-mail: literature@gasboy.com •· Internet: http://www.gasboy.com

IMPORTANT WARNINGS AND SAFEGUARDS

Gasoline and petroleum products are flammable. To avoid injury or death to persons or damage to equipment or property, follow these listed warnings and other warnings and precautions outlined in this manual when installing, using, or working around this equipment. Check with Gasboy Technical Services for compatibility of liquids with pump materials.

TURN OFF AND LOCK OUT ALL POWER TO PUMP BEFORE PERFORMING SERVICE, MAINTENANCE OR IN THE EVENT OF A FUEL SPILL.

All products must be installed by a qualified installer and used in conformance with all building, fire, and environmental codes and other safety requirements applicable to its installation and use, including, but not limited to, NFPA 30, NFPA 30A, NFPA 395 & NFPA 70. A qualified installer is familiar with fuel systems installations under the above stated building, fire, and environmental codes and other safety requirements for the particular type of installation.

This product is only part of a fuel dispensing system and additional equipment and accessories, such as, but not limited to, breakaway connectors, shear valves, pressure regulators, flow limiters, and other safety devices may be necessary to meet the applicable codes.

For maximum safety, we recommend that all employees be trained as to the location and procedure for turning off power to the entire system. Instructions regarding proper operation of the equipment along with the appropriate safety warnings should be posted in plain view at the fuel island.

Before performing service or maintenance (including changing of fuel filters or strainers) or in the event of a fuel spill, turn off and lock out all power to the system. In battery-powered pumps, disconnect power source. In submersible pump applications, turn off and lock out power at the master panel and close any impact valves to the submersible pump and any other dispensers which use that submersible pump. AC power can feed back into a shut-off dispenser when dispensers share a common submersible pump or starter relay. Also block islands so no vehicles can pull up to the dispenser when performing maintenance on the dispenser.

DO NOT use Teflon tape for any pipe threads in the product.

DO NOT use consumer pumps for pumping fuel or additives into aircraft.

DO NOT use commercial pumps for direct fueling of aircraft without filters and separators necessary to ensure product purity.

DO NOT use where sanitary design is required (for food products for human consumption) or with water-based liquids.

DO NOT smoke near the pump or when using the pump.

DO NOT use near open flame or electrical equipment which may ignite fumes.

DO NOT permit the dispensing of gasoline or other petroleum products into a vehicle with its motor running.

DO NOT permit the dispensing of gasoline or other petroleum products into unapproved containers or into approved containers in or on vehicles including trucks. All containers must be filled on the ground to prevent static discharge. Always use Approved and Listed hoses and nozzles with electric pumps and dispensers.

DO NOT block open the nozzle in any manner. Nozzles shall conform to UL and NFPA code requirements for attended or unattended service.

DO ensure that the pump is equipped with proper filters based on the product being dispensed and its intended use.

DO wear safety goggles and protective clothes when dispensing any liquid which may be potentially harmful or hazardous.

DO keep all parts of body and loose clothing clear of belts, pulleys, and other exposed moving parts at all times.

DO require washing and changing of clothes if fuel is spilled on a person or his/her clothing. Keep away from open flames, sparks, or people smoking.

DO provide a receptacle for catching product from pump/meter when servicing.

DO clean up product spills on the driveway. Turn off and lock out all power prior to cleanup.

DO ensure pump is properly grounded.

DO ensure hose is compatible with fluid being dispensed.

DO inspect hose, nozzle, and pump on a regular basis for wear, damage, or other conditions which may create a safety or environmental hazard.

DO make sure all pipe threads are properly cut and the inside reamed to remove burrs. Use UL classified gasoline-resisting compound on all joints of gasoline handling piping. Sealing compound must also be resistant to Gasohol (Ethanol and Methanol). Use gasoline-resistant pipe compound on male threads only; ***pipe compound used on female threads can be squeezed into the supply line where it can enter the product stream and become lodged in the pump or meter.***

DO ensure that junction box covers are in place and properly tightened. Mating surfaces between the box and cover must be free of dirt, nicks, and scratches. Properly plug all unused entries into the junction box.

CONTENTS

Section 1

INTRODUCTION

PURPOSE

The Gasboy *Series 70 and 1800 Consumer Electric Pumps Installation/Operation Manual* is provided to assist the installer in installing and operating the unit. Faulty installations are the major cause of unit malfunctions. This manual should be supplied to the electrician prior to the installation of conduit and wiring. The Series 70 or 1800 pumps **must** be installed and operated as described in this manual. This manual also contains warnings, safeguards and procedures on the use and care of the pump. Be sure to leave this manual with the pump owner after the installation is complete.

Customers and installers having any questions pertaining to the installation should contact their GASBOY distributor.

SPECIFICATIONS

Series 70 and Series 1800 pumps are made specifically for private use on vented tanks. While their outward appearance differs, they basically offer the same features. These pumps can be mounted on aboveground skid tanks, directly mounted above underground tanks, or mounted on pedestals for remote underground installations. Table 1-1 summarizes the features for each model.

Pumping Unit:	Self-priming, direct-drive rotary vane; 23 PSI (1.6 bars) stainless steel bypass; check valve with pressure relief valve.
Motor:	1/3 HP, 1725 RPM motor with thermal overload protection and auxiliary AC line. Standard 115 VAC, 60 Hz; optional 230 VAC, 50 Hz. AC junction box included.
Register:	70: 4-wheel push-button reset, 7-digit master totalizer 1820: 3-wheel, volume only; lever-type reset with interlock; 6-digit master totalizer (Optional, except for 1820R: 4-wheel push-button) Registers show delivery in US gallons, Imperial gallons, or liters and change gears are available to convert registers for unit of measure.
Meter:	Nutating disk phenolic measuring chamber in aluminum die-cast housing; adjustable calibration $\pm$.5% at full flow
Hose & Nozzle:	12' (3.66 m) UL-Listed hose assembly with integral static discharge wire; manual self-closing nozzle.
Connections:	2-inch (5.08 cm) NPT for tank opening; 1-inch (2.54 cm) suction; 3/4-inch (1.91 cm) NPT discharge
Strainer:	100-mesh nylon
Delivery Rate:	18 GPM, at 115V, 60 Hz.; 60 LPM at 60 Hz.; 68 LPM at 50 Hz.
Finish:	High-gloss red urethane or color of choice. 1820 only: Stainless steel extra cost option.
Approvals:	UL, CSA

Additional extra cost options include: vapor recovery, vacuum breaker return line, longer hoses, hose breakaways, automatic nozzles, external filters, wall mounting kits, and for Series 1820 only, 10:1 pulser or rear- or side-mount filter kits.

MODEL	REGISTER		CABINET STYLE			10:1 PULSER*	INSTALL–A–SOCKET	SUCTION PIPE	MOUNTING
	3–DIGIT	4–DIGIT	ROUNDED W/BEZEL	SQUARED PAINTED	SQUARED ST STL*				
72S		X	N/A	N/A	N/A	N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
72X	N/A	N/A	N/A	N/A	N/A	N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
73**	N/A	N/A	N/A	N/A	N/A	N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
1820	X		X			N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
1820R		X		X		N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
1820RSS		X			X	N/A	X	CUSTOMER SUPPLIED	UNIVERSAL
1820RC		X		X		X	X	CUSTOMER SUPPLIED	UNIVERSAL
1820RCSS		X			X	X	X	CUSTOMER SUPPLIED	UNIVERSAL

*OPTIONAL. EXTRA COST. **COMES WITH HOSE AND NOZZLE.

Table 1-1. Series 70 and 1820 Features

Stripped-down versions of Series 70 pumps, which mount on customer-supplied piping and fittings, are available. Model 72X has no attachments or register; Model 73 has a hose and nozzle, but no meter or register.

Section 2

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, Automotive and Marine Service Station Code (NFPA 30A) and NFPA 395 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 **DO's** and **DON'T's** to avoid potential problems:

1. **DO** read the **WARNINGS** page at the front of this manual, preceding the Table of Contents. It contains important information regarding the safe use of your pumps.

2. **DO** install an emergency power cutoff if the pump is used for other than personal use. In addition to circuit breaker requirements of NFPA 70 and NFPA 30A, a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes. In order to provide the highest level of safety, we recommend that all employees be trained as to the location and procedure for turning off power to the dispensing equipment.

3. **DO** use breakaway couplings on discharge hose. While not required for tanks under 1100 gallons, use is recommended for safety reasons.

4. **DO** have the pump installed by a competent installer/electrician.

5. **DO NOT** experiment with a pump if you are not sure the installation is correct.

6. **DO NOT** overload sub- or main breaker panels.

7. **DO NOT** install any underground piping without proper swing joints. (Always use shoulder nipples, never close nipples).

8. **DO NOT** cover any lines until they have been both air- and liquid-tested.

9. **DO NOT** back-fill the tank or supply line with cinders or ashes. (Back-fill with clean sand, crushed rock, or pea gravel).

10. **DO NOT** use black iron pipe or fittings for underground installations. (Use only new galvanized or fiberglass* pipe and fittings). *Install all fiberglass pipe and fittings according to manufacturer's specifications and requirements.

11. **DO NOT** use power line wiring of inadequate capacity. (Use gauge specified by the wiring diagram or wire chart provided in Section 3).

12. **DO NOT** use a circuit breaker of improper size. (See Section 3).

13. **DO NOT** install fill pipe to tank where it can be submerged with standing water.

14. **DO NOT** use the Gasboy fuel dispensing equipment to remove water ballast from the storage tank.

15. **DO NOT** use gaskets on covers of explosion-proof type boxes. The sealing compound found around wires at all junction box entrances is a requirement of the National Electrical Code and should not be disturbed. Tighten junction box covers before replacing panels.

16. **DO NOT** use knock-out boxes or flexible conduit for installing this unit. All power and lighting wires should be run in threaded, rigid, metal conduit. All threaded connections must be drawn up tight with five (5) threads minimum engagement. Only one opening in the AC junction box is provided. At completion of the installation, it is the installer's responsibility to ensure that any unused openings are plugged.

SUPPLY LINE - UNDERGROUND TANKS

If you are using an underground tank, pitch the tank away from suction end. Horizontal runs of suction line should slope down from the pump toward the tank. Do not exceed an equivalent lift of 12' for gasoline or 14' for diesel to the center line of the pumping unit, including friction resistance in the suction pipe.

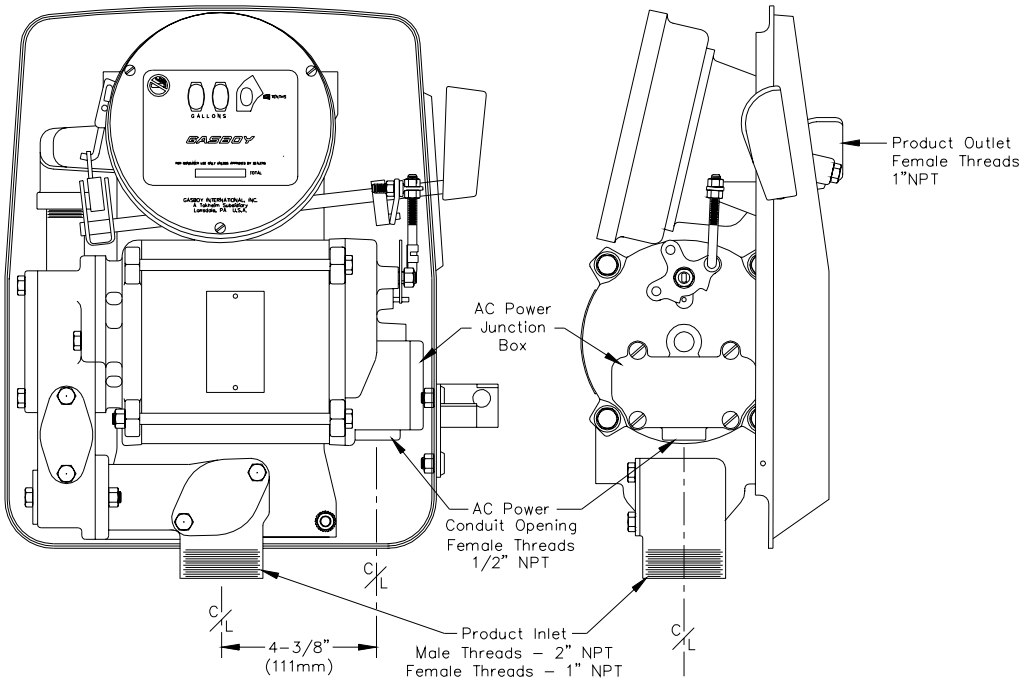
The end of the suction pipe must be at least three-inches from bottom of tank.

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.

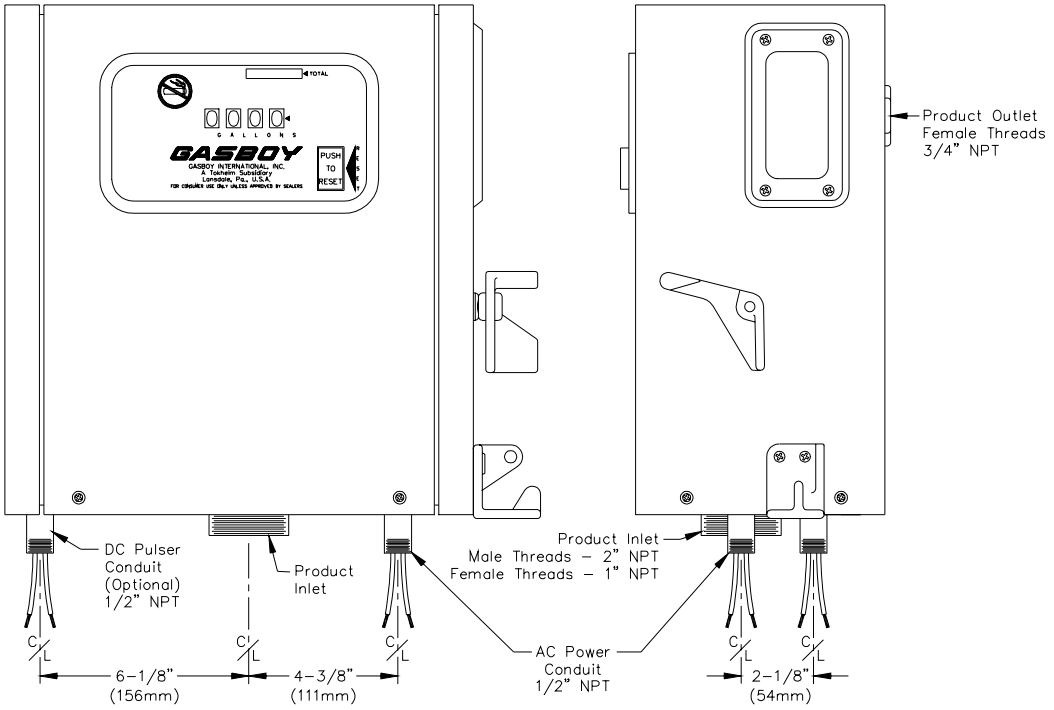
PUMP DIMENSIONS - SERIES 70, MODEL 1820

Pump diagrams shown are for Model 1820. Pump dimensions are the same for all Series 70 pumps.



PUMP DIMENSIONS - MODEL 1820R

Pump diagrams shown are for Model 1820R. Pump dimensions are the same for these Model 1820 pumps: 1820R, 1820RSS, 1820RC, 1820RCSS.



INSTALLATION INSTRUCTIONS

Cabinet Removal for Installation or Service (Series 1820 Only) - Rounded Cabinet

1. Remove two screws, one on each side of the cabinet.

2. Pull front panel assembly forward at bottom. As it clears the pumping unit, lift up to remove.

3. To replace front panel, engage pins at top in matching holes in rear panel. With front panel assembly tilted back, pins may be seen through dial opening. Front panel assembly will now drop back into position.

4. Reinstall two screws in sides.

Cabinet Removal for Installation or Service (Series 1820R Only) - Squared Cabinet

1. Remove two screws on lower front of cabinet.

2. Remove two screws from upper back of cabinet.

3. Push in and hold the reset button and pivot the cabinet front panel upward until it clears the button (Be careful not to damage the button). Remove panel.

4. For calibration or service, remove the lefthand side panel by unscrewing the two screws on the bottom side of the cabinet.

5. To reassemble pump cabinet, align side panel screw holes with holes on base of cabinet and screw tight. Replace the cabinet top and front panel by positioning the back plate and pivoting the assembly forward. Be sure to press in the reset button until the front panel clears it. Then replace the screws in the front and back of cabinet.

Installing Hose and Nozzle

To prevent undue stress and possible damage, install hose and nozzle after installation of pump. Hose must have static wire which provides electrical continuity between hose couplings to dissipate static electrical charge.

1. Screw the pipe elbow (provided with the pump) into the product outlet on the back of the pump. Apply gasoline-resistant pipe compound to male threads.

   NOTE: Elbow fitting is not required, however, it provides strain relief for the hose.

2. Screw the hose into the open end of the elbow and tighten. Apply gasoline-resistant pipe compound to male threads.

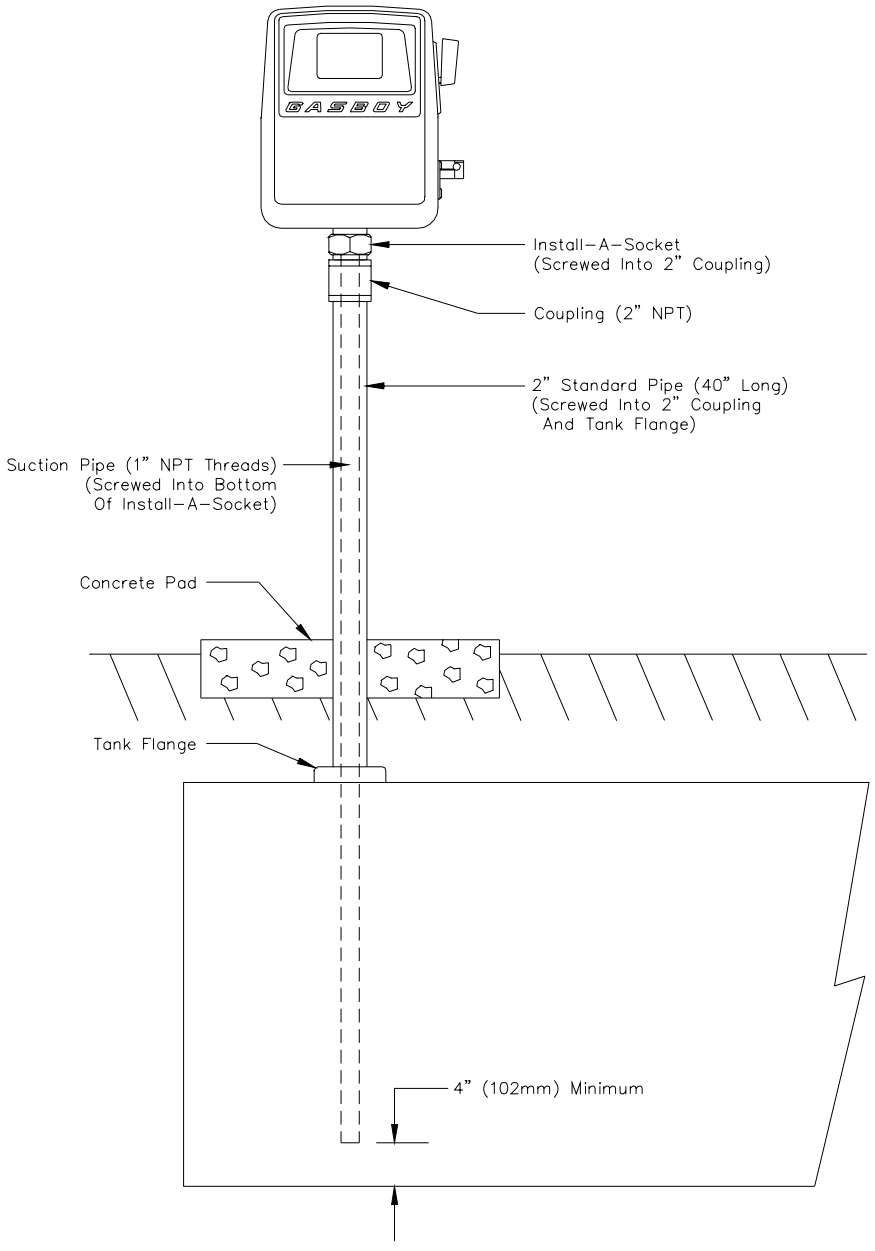
3. Screw nozzle onto hose.

NOTE: 1820R models are shipped with a vacuum breaker assembly (P/N 032701) consisting of a tee, pipe nipple and vacuum breaker. This assembly should be installed in the pump outlet before connecting the hose.

Direct Mount on Underground Tanks

1. Screw 2-inch coupling onto 2-inch standard pipe.
2. Screw 2-inch standard pipe into 2-inch tank flange. Apply compound to threads at bottom of base to prevent surface water from entering the tank.
3. Screw 1-inch suction pipe into install-a-socket. Suction pipe should be long enough to allow 3-inch clearance from bottom of tank. Apply gasoline-resistant pipe compound to male threads.
4. Lower 1-inch suction pipe through 2-inch standard pipe into tank. Tighten install-a-socket into coupling at top of standard pipe.
5. Screw pump (2-inch threaded base) into install-a-socket. This is a suction line connection and must be tight. Apply gasoline-resistant pipe compound to male threads.

   See the **Conduit** section for correct installation of electrical conduit.

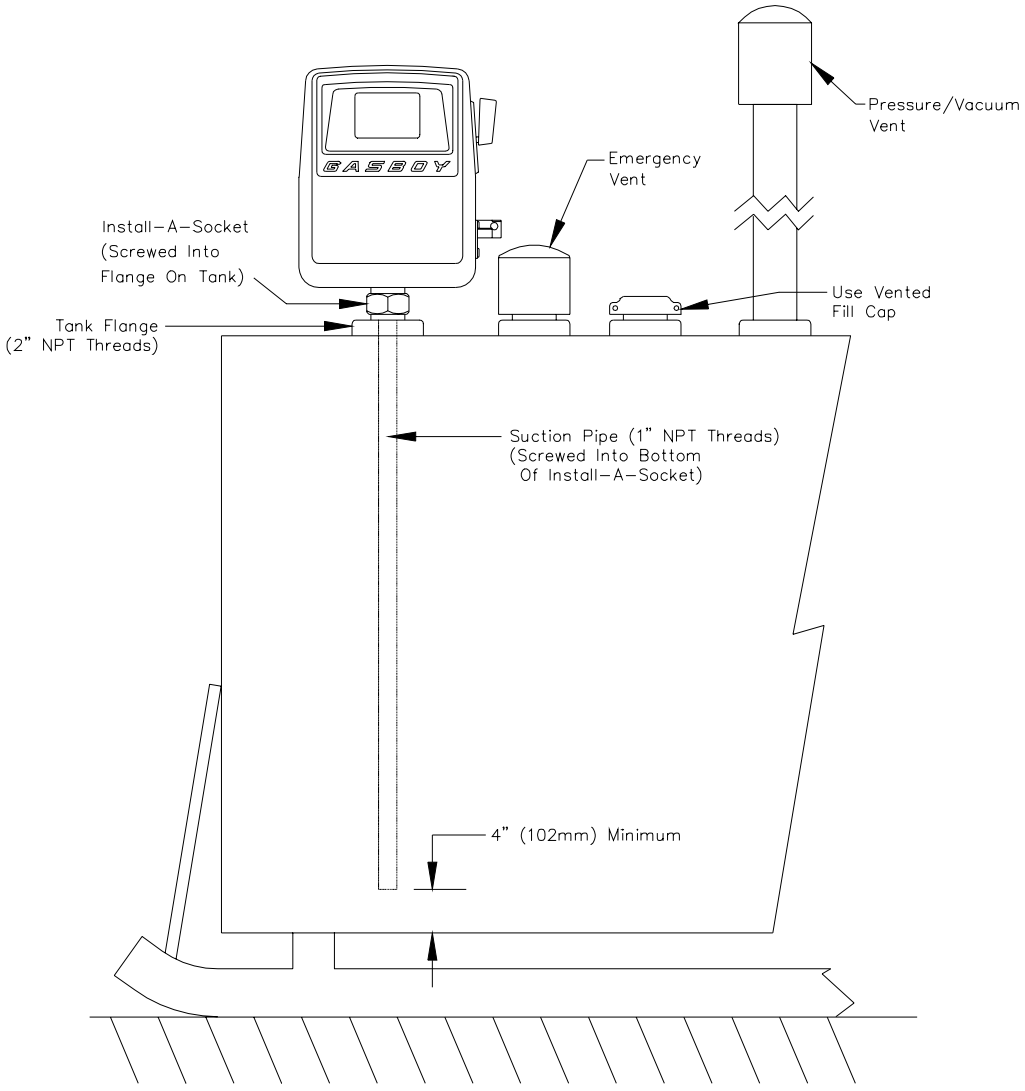


Direct Mount on Aboveground Tank

Aboveground tanks require both a pressure/vacuum vent and an emergency vent. The pressure/vacuum vent reduces losses due to evaporation and is an air quality control measure. The emergency vent provides a relief from the pressure resulting from heating and boiling of the tank contents during a fire situation. Both vents must be properly sized for a given tank.

1. Screw 1-inch suction pipe into install-a-socket. Suction pipe should be long enough to allow 3-inch clearance from bottom of tank. Apply gasoline-resistant pipe compound to male threads.
2. Screw install-a-socket directly into 2-inch flange in the aboveground tank.
3. Lift the pump to the height of the tank and tighten it into the install-a-socket. Apply gasoline-resistant pipe compound on male thread. *NOTE: If using an automatic nozzle with the extended nozzle hanger, you may need to use a 2-inch coupling and close nipple in between the pump and the install-a-socket. This will prevent interference of the hanger with the top of the tank.*

   See the **Conduit** section for correct installation of electrical conduit.

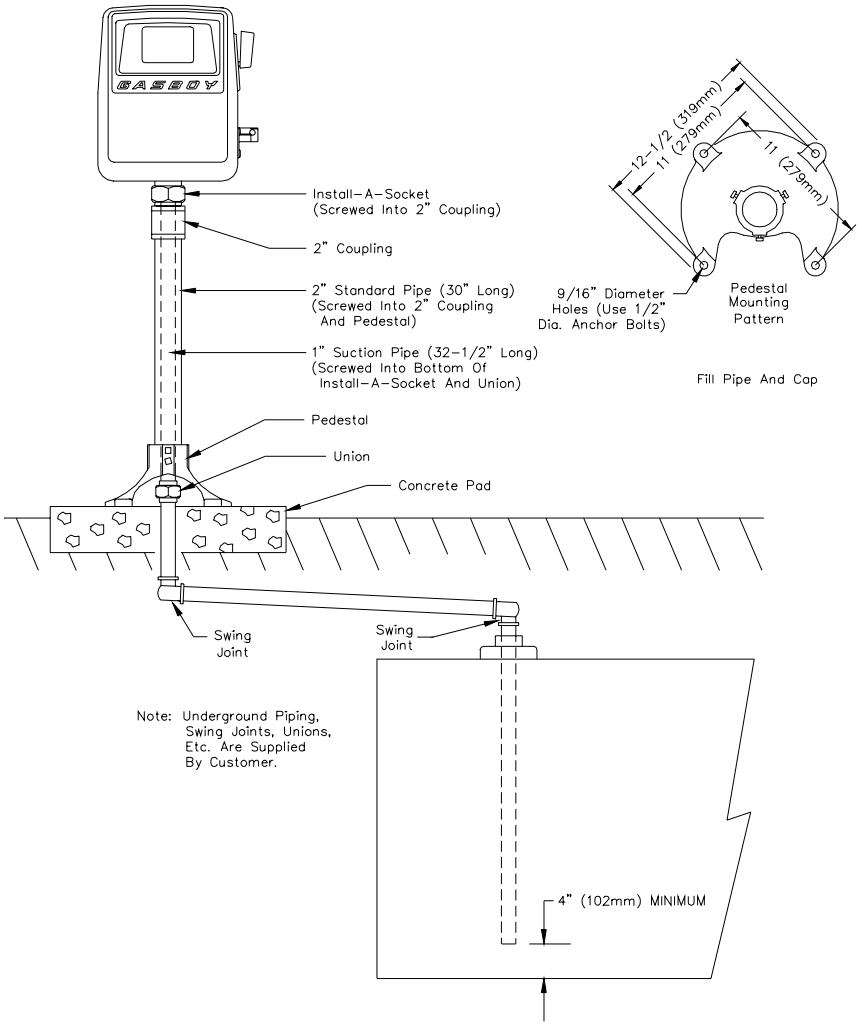


NOTE: Aboveground tanks, located at commercial, industrial, governmental, or manufacturing establishments and intended for fueling vehicles used with their business, cannot exceed a capacity of 6000 gallons.

Pedestal Mount Pump

1. Screw 2-inch coupling onto threaded end of 2-inch standard pipe.
2. Slide cast iron pedestal base up over the unthreaded end of 2-inch standard pipe.
3. Screw 1-inch suction pipe into install-a-socket. Suction pipe should be long enough to allow 3--inch clearance from bottom of tank. Apply gasoline-resistant pipe compound to male threads.
4. Insert 1--inch suction pipe into 2--inch pipe and screw install-a-socket into coupling on end of 2-inch pipe.
5. Assemble union onto lower end of 1-inch suction pipe conforming to your site's piping layout. Note that the GASBOY base is provided with an opening on one side, so that an elbow can be used and the suction brought out horizontally aboveground if desired, instead of straight down through the island.
6. Slide base down to proper position at the lower end of the pedestal, tighten six set screws.
7. Screw the 2-inch male thread on the base of the pump into the upper end of the install-a-socket. Apply gasoline pipe compound to all male threads.
8. Securely mount pedestal base to concrete. If the pump is not securely fastened to the foundation, supply line leaks at unions and pipe joints may occur.

   See the **Conduit** section for correct installation of electrical conduit. All underground piping and swing joints are supplied by the customer. All metallic piping should be at least Schedule 40 wrapped/coated black steel pipe with extra-heavy malleable iron screw type fittings. Protect metallic piping in contact with the ground with a properly designed cathodic protection system.

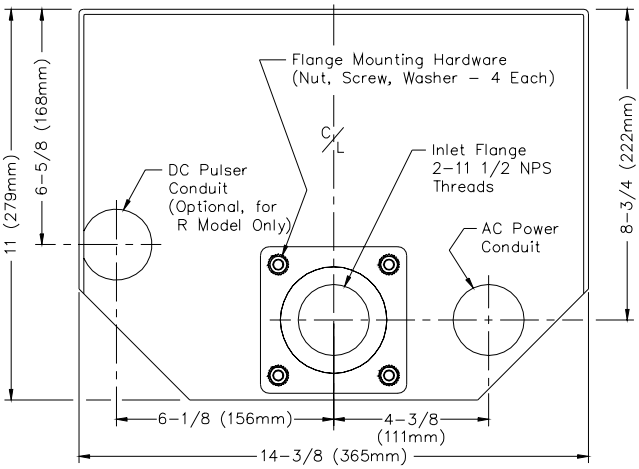


Wall Mount

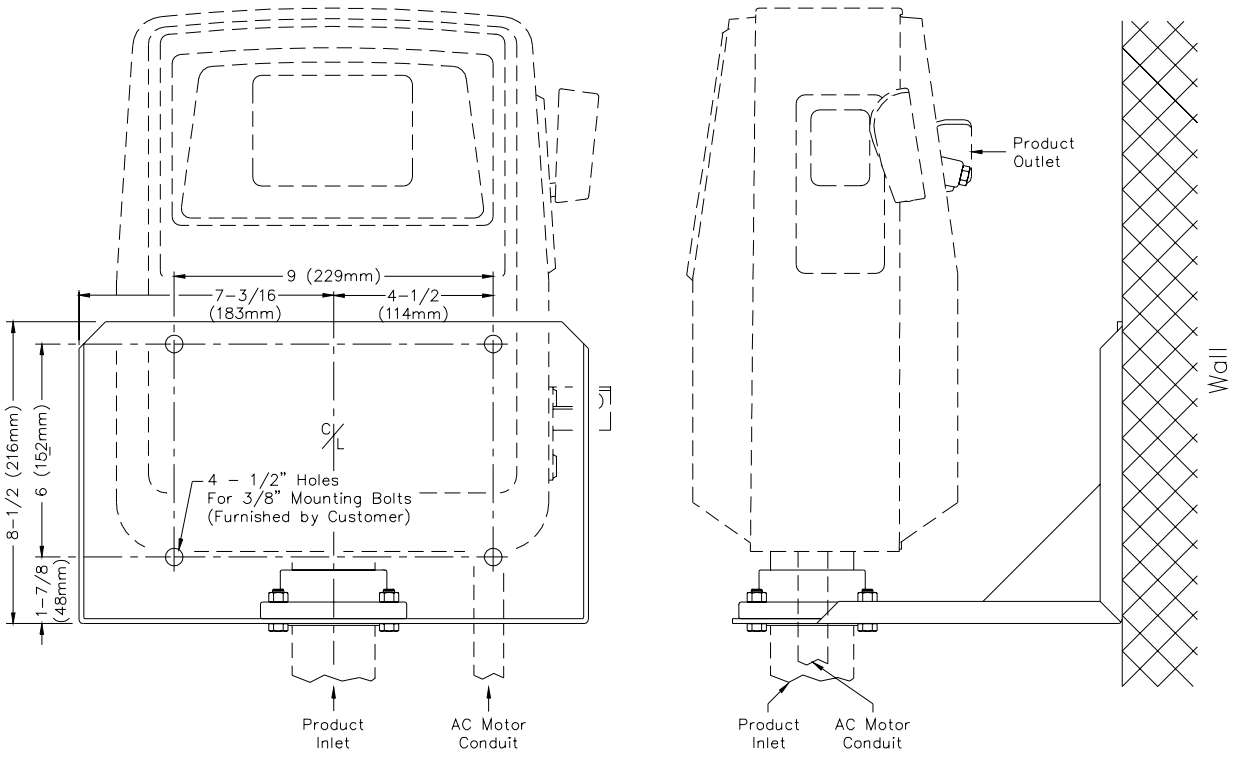
The optional wall mount kit can be used with any Series 70 or 1820 pump to be located remote from the tank. The wall mount kit consists of a wall-mounting bracket, pump mounting flange, and hardware to attach the flange to the bracket. Hardware to attach the bracket to the wall is not included.

1. Fasten mounting bracket to wall using appropriate 3/8-inch fasteners (customer supplied).
2. Screw mounting flange to pump inlet. The flange with the four holes should be away from the pump. Pipe thread compound is not required. Tighten flange and align parallel with pump.
3. Bolt mounting flange to mounting bracket using the hardware supplied.
4. Remove the 1-inch plastic plug within the 2-inch pump base inlet and install the 1-inch inlet NPT inlet line from the tank into the pump. Apply gasoline-resistant pipe compound to male threads. Follow piping instructions shown on previous page for piping to the tank.

   See the **Conduit** section for correct installation of electrical conduit.



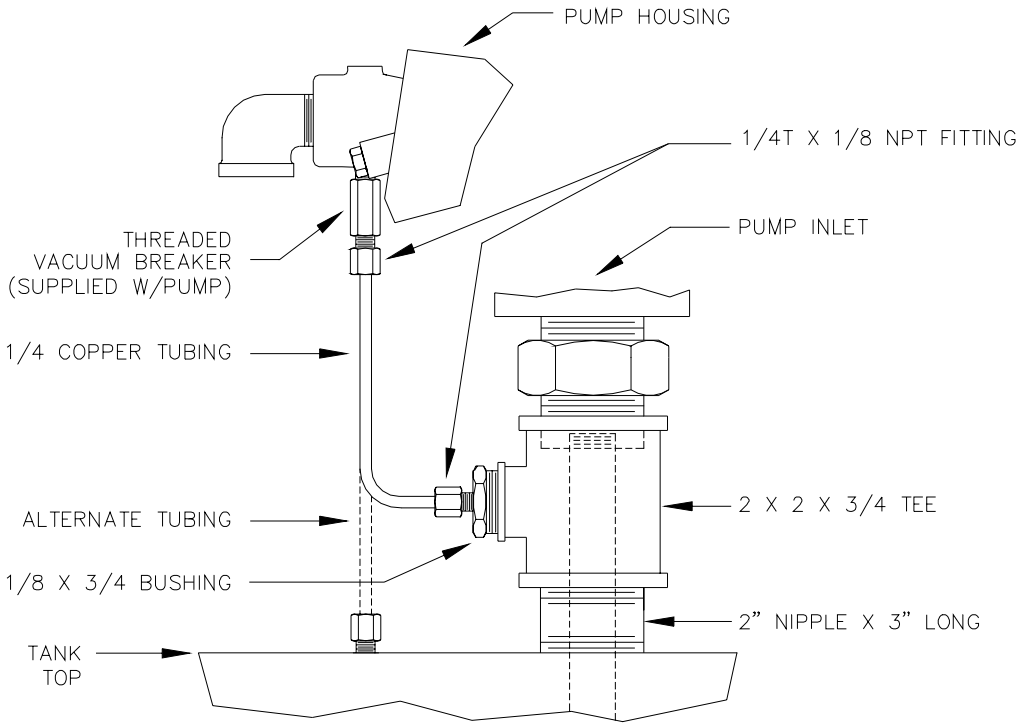
NOTE: If the top of the tank is higher than the pump inlet flange, then a solenoid valve (customer–supplied) should be located as close as practical to the tank penetration to prevent pump leakage and to prevent tank drainage in case of line rupture when the pump is off. The solenoid valve should be a fail–closed valve and can be controlled by the brown switch detect wire from the motor (See NFPA 30A, paragraph 2–17). A Tokheim Model 52 valve can be installed directly under the pump as an alternative to the solenoid valve.



Vacuum Breaker

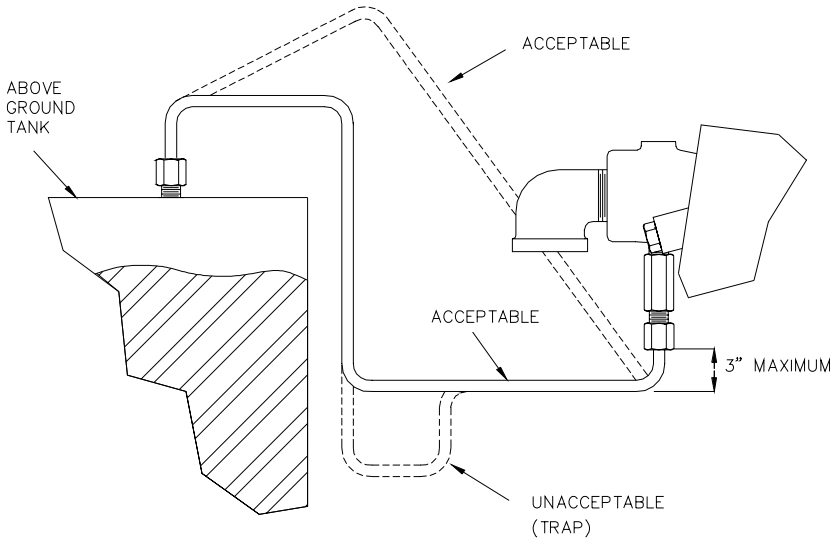
The vacuum breaker tubing kit can be used with any Series 70 or 1820 pump. The vacuum breaker is used to break a siphon should the nozzle drop below the fluid level in the tank while the pump is stuck in the open position. A threaded vacuum breaker, P/N 066570 is shipped installed in the pump. GASBOY Requires that the vacuum breaker be tubed back to the tank using UL Listed fittings.

The illustration below shows two methods for installing tubing for the vacuum breaker. In all instances, the vacuum breaker must be tubed (using 1/4-inch tubing) to the vapor space at the top of the tank; if the tube is installed below the fluid level of the tank, the ability to break vacuum and prevent siphoning will be lost. Using the illustrated methods, the tube end may terminate into the annular vapor space between the 1-inch suction pipe and the 2-inch mounting pipe, or into an opening in the top of the tank. All components shown are provided when you order the kit, P/N 032700.



NOTE: Tubing can be piped to any available opening on top of tank. Use reducer bushings as required.

The illustration on the next page shows vacuum breaker tubing for installations where the pump is installed below the fluid level of the tank. For these installations, the tubing must run directly to the tank top. The tubing must be horizontal or must slope either toward the pump or the tank so there are no traps or low spots. Traps or low spots can severely affect vacuum breaker performance. Tubing length should not exceed eight feet.



NOTE: Tubing can be piped to any available opening on top of tank. Use reducer bushings as required.

Testing the Vacuum Breaker

1. Charge tubing completely with fluid.

2. Turn on pump and run for several minutes to purge any air from the system.

3. Turn off pump.

4. With nozzle at ground level and discharging into a container, open nozzle. A small quantity of fluid (several cups) should drain and then stop.

Section 3

WIRING

WIRING PRECAUTIONS

The quality of the electrical installation is a major factor in maintaining proper safety levels and providing trouble-free operation of your GASBOY pump. To assure a quality installation, follow these rules:

1. Have the pump installed by a competent installer/electrician.

2. All wiring must be installed to conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, Automotive and Marine Service Station Code (NFPA 30A), and NFPA 395 codes and regulations.

3. Use only threaded, rigid, metal conduit.

4. Use only UL-approved insulated gasoline- and oil-resistant stranded copper wiring of the proper size.

5. Wire connections should be tightly spliced and secured with a wire nut; close off the open end of the wire nut with electrical tape.

6. The line to the motor should be on a separate circuit and installed on a 15 AMP breaker. This should be sufficient for either 115V, 60 cycle or 230V, 50 cycle operation.

7. The unit must be properly grounded.

8. Install an emergency power cutoff if the pump is used for other than personal use. In addition to circuit breaker requirements of NFPA 70 and NFPA 30A, a single control which simultaneously removes AC power from all site dispensing equipment is recommended. This control must be readily accessible, clearly labeled, and in accordance with all local codes. In order to provide the highest level of safety, we recommend that all employees be trained as to the location and procedure for turning off power.

9. When DC pulsers are used in the pump, the AC and DC wires must not share any conduits, junction boxes, or troughs.

CIRCUIT BREAKERS

Power to the unit should be supplied from a dedicated 15 AMP circuit breaker. No other equipment should be powered from this breaker. This motor draws the following current: 115VAC, 60 cycle, 5.1 amps; 230VAC, 50 cycle, 1.95 amps. If two (2) pumps are supplied from one breaker, that breaker must be capable of handling the load of both motors. Provisions must be made to break both legs of any AC circuit.

GROUNDING

To ensure proper operation of the equipment and provide the necessary safety factors, this unit must be grounded. A ground wire (preferably green) must be connected between the unit's AC junction box ground lug and the main electrical service panel. One (1) earth ground connection is required per unit. The ground rod is to be a solid, corrosion-resistant conductor and must be installed at the main electrical panel in accordance with the National Electrical Code. It should be properly tied into the ground bus strip of the panel. We recommend the neutral and ground bus strips be bonded together (unless prohibited by local codes).

THE PUMP MOTOR

Pumps are shipped from the factory with motors wired for either 115VAC, 60 cycle, or 230VAC, 50 cycle.

The pump motor is equipped with thermal overload protection. If overheated, it will shut itself off without any damage to the windings. Be sure to turn off the pump power if this occurs. As the motor cools, it will start without warning if power is on.

WIRE SIZE

The AC wire size of the AC power lines of a pump depends on the voltage at which the pump will be operated (115/230) and the distance from the circuit breaker panel to the pump. When two pumps are powered from the same breaker through the same wires, the gauge of the wires should be increased to handle the added load according to the distance from the breaker panel. Use the chart below to select the proper wire size for your installation.

Table 3-1. Wire Size

WIRE GAUGE SIZES FOR 1/3 HP MOTOR			
DISTANCE (FEET/METERS)		115 VAC GAUGE	230 VAC GAUGE
25’	7m	14	14
50’	15m	14	14
100’	30m	12	12
150’	46m	10	12
200’	61m	8	12
250’	76m	8	12
300’	91m	8	12

The AC wire size for the reset complete (switch detect) line should be 14 AWG (when it is used).

PULSER WIRING

An optional pulser (available on the Series 1820R only) is used when external monitoring of the dispensing unit operation is desired. The pulser transmits one electrical signal (pulse) for each predetermined amount of fuel dispensed. Reed 10:1 pulsers operating with DC voltages are used. Pulser wiring must be 18AWG and installed in metal conduit separate from all AC wiring. It cannot share a common junction box, wiring trough or conduit with any AC wiring.

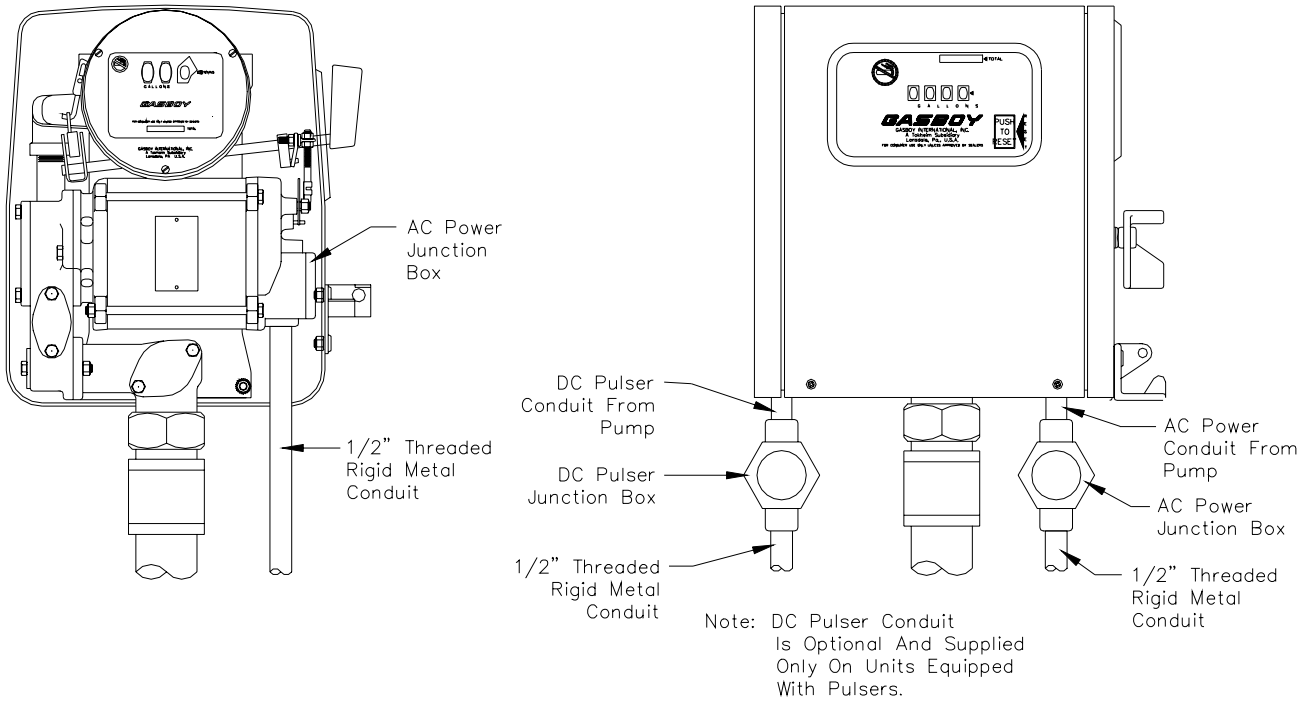
CONDUIT

All wiring to the GASBOY pump must be installed in 1/2-inch threaded, rigid, metal conduit. Do not use knockout boxes and flexible conduit.

If equipped with a DC pulser, AC power wires must be installed in a separate conduit from the DC pulser and the AC power wires and DC pulser wires must not be run in any sort of common conduit or trough.

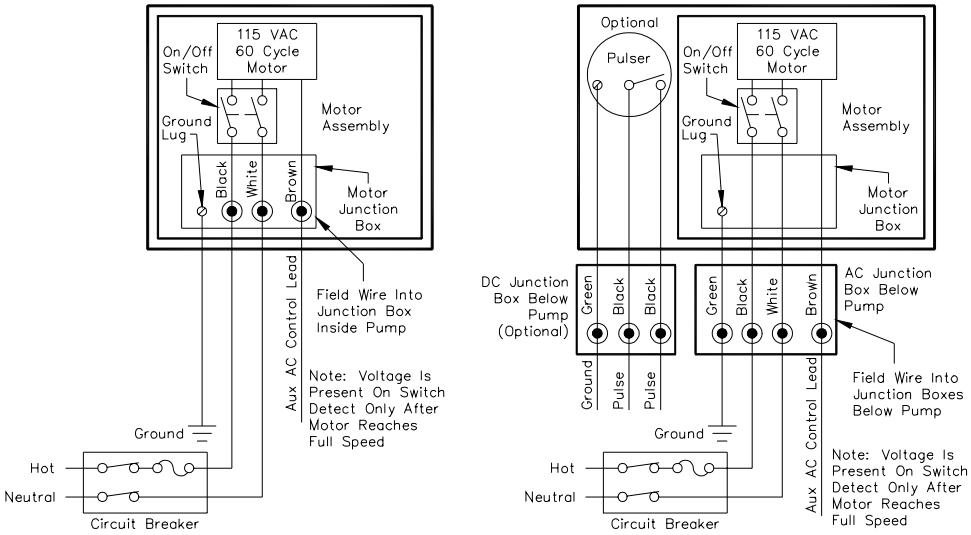
All wiring and conduit runs must also conform with the National Electrical Code (NFPA 70) and the Automotive and Marine Service Station Code (NFPA 30A). All wiring and conduit runs must conform to local codes.

The conduit layout drawing on the left is for all Series 70 and 1820 rounded cabinet models. The drawing on the right is for 1820R models. The junction boxes shown below the 1820R are supplied with the pump.

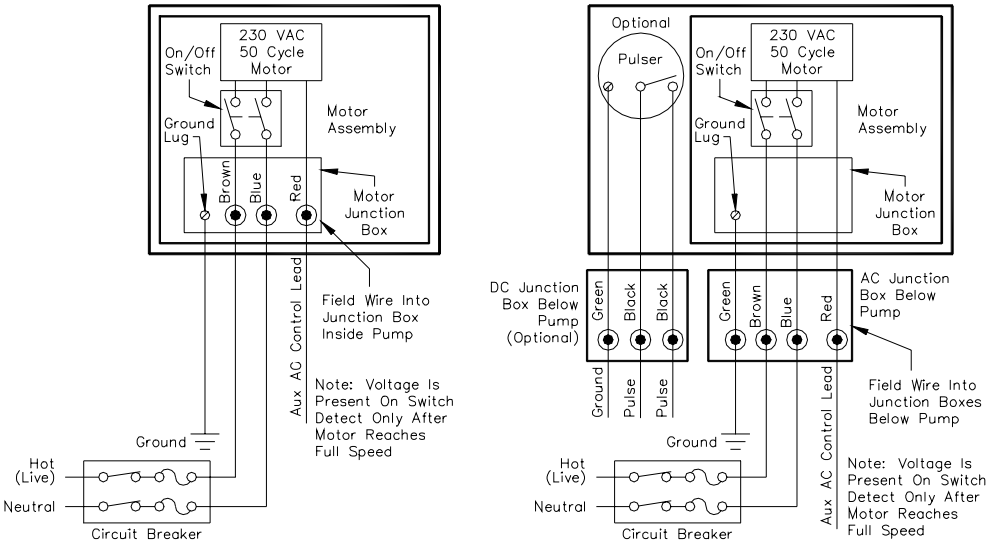


PUMP WIRING DIAGRAMS

115VAC Pumps Series 70 and 1820 (left) and Series 1820R (right)



230VAC Pumps Series 70 and 1820 (left) and Series 1820R (right)



NOTE FOR 230V MOTORS: Some motors may contain different wire colors than those shown. In this case, Hot is Black, Neutral is White and Aux AC Control is Brown.

1. All wiring and conduit runs must conform with all building/fire codes, all Federal, State, and Local codes, National Electrical Code, (NFPA 70), NFPA 30, Automotive and Marine Service Station Code (NFPA 30A), and NFPA 395 codes and regulations.
2. For the Series 70 and Series 1820 rounded cabinet models, make the field wire connections in the motor junction box. The 1820R models with the squared cabinet come with the wires already extended through the end of a factory-installed conduit. The 1820R models also come with a junction box which is to be mounted directly beneath the pump. The field wire connections for the 1820R models should be made in this junction box (not the pump motor junction box). Wire connections should be tightly spliced and secured with a wire nut. Close off the end of the wire nut with electrical tape.
3. The Aux AC Control Lead wire is shipped capped from the factory. When used, it connects to a solenoid valve or fuel management system. Do not connect this wire without first checking the ON voltage of this line to ascertain compatibility with the equipment being connected.
4. Pulser wiring must be 18AWG and installed in metal conduit separate from all AC wiring. It cannot share a common junction box, wiring trough or conduit with any AC wiring.

Section 4

STARTUP AND OPERATION

PRE-STARTUP CHECKLIST

The information below should be reviewed to help verify the proper installation of your GASBOY pump. **If the installation does not meet criteria listed, as well as any Federal, State, and Local codes and requirements, correct the problem before powering on the unit.**

1. The unit must be properly secured.
2. All plumbing must be complete and tight. **All liquid-carrying lines must be checked for leaks**.
3. When DC pulsers are used in the pump, the AC and DC wires must not share any conduits, junction boxes, or troughs.
4. All conduit work must be complete. All junction box covers must be secured. Conduit seals should not be sealed until the wiring is verified through proper operation.
5. The unit must be properly grounded.
6. Before any testing begins, remove any water in the tank through a fill opening, using a suitable pump. Do not use the GASBOY pump to remove water. Serious damage may occur.
7. A sufficient volume of fuel must be put in the tank to insure that the liquid level is above the bottom of the suction pipe.
8. Before placing nozzle into service, apply a few drops of light machine oil (such as 3-in-1) on the stem. Operate the lever several times so that the oil penetrates the packing. This offsets the drying action of gasoline and keeps the packing soft and pliable.

STARTUP

After successfully verifying the installation against the completion check list, the unit is ready for startup. Follow the procedure listed below to perform an orderly start-up.

1. Turn on the circuit breaker for the pump.
2. Remove the nozzle from the boot and turn on the pump handle.
3. If your model has an automatic reset, verify that the register resets to zeros. If your model has a reset button, push it to zero the register.
4. Dispense fuel. Check all plumbing for leaks at this time.
5. Turn the pump handle off. Open the nozzle. No fuel should be dispensed. The amount delivered should be displayed on the register. If an optional pulser kit is attached, it will be supplying pulses which may be recorded by an external monitoring system.
6. Repeat Steps 2 through 5 several times to ensure that the pump is operating satisfactorily.

POST-STARTUP TESTS

Voltage
The incoming voltage to the pump should be checked and any reading not within 10% of rated voltage should be corrected before testing is continued. When dealing with suction pumps, it is good practice to take voltage readings while the suction pump is operating on bypass (turned on but not dispensing product) and also while making a delivery. Any voltage drop in excess of 10% during either of these operating states should be considered a low voltage condition. Corrective action should be taken to insure an adequate power supply to the pump.

Tightness
After determining that the pump is operating satisfactorily and the system is fully primed, check the pump and piping to make sure that all connections are tight. We recommend that the tank and all piping not be covered until this has been completed.

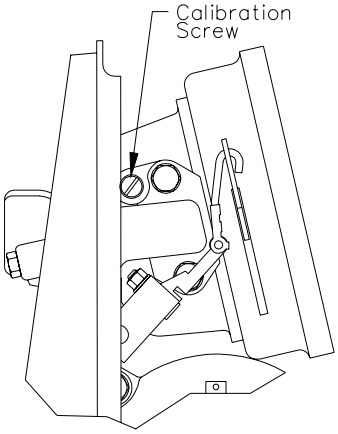
Meter Calibration
NOTE: This meter was redesigned causing the calibration procedure to be different depending on the age of your meter. Meters made after May 10,1995 are referred to as new style meters; meters made before that date are referred to as old style.

All GASBOY pumps are adjusted for accurate measure for gasoline within $\pm$ .05 gallons at the factory. However, since the conditions of the installation can affect pump accuracy, it is the responsibility of the installer to check the pump for accuracy and make any needed adjustments. *Where required*, it is the owner's responsibility to report this device to the local Weights and Measures officials for their inspection before the unit is put into service.

Choose the flow rate at which the meter will be used most often for the zero calibration point. For example, if the pump is being used with an automatic nozzle, calibrate with the nozzle set on the middle or top notch position, whichever is used most frequently.

Use a certified five-gallon measure with a sight glass and scale showing cubic-inches over or under an exact five gallons. Fill and drain the test measure to completely wet the interior surfaces. Reset the register to zero and deliver an exact measured five gallons into the test measure at the selected flow. Read the level of the liquid in the sight glass on the scale in $\pm$ cubic-inches.

Follow the instructions in Section 3, **Cabinet Removal for Installation or Service** to access the calibration screw. Use a narrow blade screw driver to turn the adjusting screw clockwise to correct for plus cubic-inches or counterclockwise for minus cubic-inches in the test measure.



Count the number of full turns and fractional turns each time for reference in judging the number and direction of any additional turns required to calibrate the meter to exact zero.

For new style meters, start with the screw turned all the way in clockwise. For gasoline calibration, turn the screw approximately two full turns counter-clockwise. For diesel, turn the screw approximately two full turns counter-clockwise.

Replace the cap screw (old style only). Deliver about 1/2 gallon through the meter before resetting to zero and retesting. Allow a ten second drain period each time the test measure is emptied to assure accurate measure. Adjust and retest until register is zeroed at desired flow.

Strainer Cleaning
Clean the strainer immediately after the pump has been installed and tested, and again after a few hundred gallons have been delivered. Thereafter, clean the strainer once every six months, or as required. The procedure for cleaning the strainer can be found in the **Maintenance and Troubleshooting** section.

DAILY OPERATION

1. To begin fueling, remove the nozzle from the boot and turn on the pump handle.

2. If your model has an automatic reset, the register resets to zeros. If your model has a reset button, push it to zero the register.

3. Dispense fuel.

4. Turn the pump handle off. The amount delivered is displayed on the register.

Section 5

MAINTENANCE AND TROUBLESHOOTING

MAINTAINING TROUBLE-FREE OPERATION

Operating your pump with reasonable care will prolong its life and provide better service. Gasboy pumps are designed and built to provide years of uninterrupted service; however, certain parts of a pump are bound to wear. To keep your pump running at maximum efficiency, Gasboy recommends a periodic inspection at least twice a year.

- **Remove Water from Tank.** After every fill-up, check your tanks for water. Water can accumulate in both underground and aboveground storage tanks due to condensation or defective fill openings that are not properly protected with watertight covers. Remove any water with a sump pump to forestall serious damage to equipment. Water, sediment, and other foreign matter that accumulates in the tank can be drawn up into the pump and cause failures.
- **Clean the Dial Face.** Use a soft, clean, damp cloth as needed.
- **Preserve the Pump's Finish.** Gasboy pump housings are finished with a coating of urethane paint. To preserve this finish, thoroughly clean all painted surfaces at regular intervals with a high grade automobile polish and protect with a coat of paste wax. Do not use abrasive cleaners or polish. Do not use high-pressure spraying equipment.

  Stainless steel cabinets also require regular cleaning, especially in corrosive environments such as coastal areas. Wash with mild detergent or soap and water followed by a clean water rinse. Avoid abrasive cleaners which may scratch the finish. Stubborn stains, such as oil or grease will require a stronger cleaner. **DO NOT** use ordinary steel wool as iron particles may adhere to the surface and cause corrosion. Always clean in the direction of the polishing lines in the steel, never across them. In hard water areas, wipe the surface dry with a soft clean cloth to prevent spotting. Protect the finish with a coat of paste wax.
- **Check and Change Filter.** If the unit is equipped with a filter, check and change it at regular intervals. A dirty filter in a pump will cause a slower delivery rate.
- **Clean the Strainer.** Clean the strainer immediately after the pump has been installed and tested, and again after a few hundred gallons have been delivered. Thereafter, once every six months, or as required. The symptoms of a dirty or clogged strainer in a pump are slow delivery, noisy operation, and pulsation.

  To clean the strainer, turn off AC power to the pump. Locate the Suction Strainer Cap on the plumbing unit and unscrew it to access and remove the strainer. Use compressed air to blow the dirt out of the strainer. Always wear protective safety goggles or glasses when using compressed air.
- **Clean the Bypass Assembly.** The bypass valve assembly should be removed only for cleaning and should be checked if there is notable loss in system performance. No adjustment is required. To remove the valve, turn off AC power to the unit, remove the two bolts to the bypass cover and lift out the bypass valve assembly.

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.

- **Turn off all power to the pump to reduce the risk of electrical shock when servicing (including changing of fuel filters or strainers). Also block islands so no vehicles can pull up to the pump while performing maintenance on the pump.**

- 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 re-use old ones. Using authorized parts will ensure the continuity of the UL Label on your pump.

  Section 6 lists parts and service procedures for the Series 70 and 1820 pumps. Using part numbers when ordering will expedite your order and reduce the possibility of the wrong parts being shipped.

The remainder of this section contains troubleshooting information and assembly/disassembly procedures for various components that may need service.

TROUBLESHOOTING

If problems are encountered in operation of the pump, follow the procedures below in an attempt to isolate the problem. When the problem is detected, follow the procedures for disassembly of the pump.

Pump will not Start

- ✓ Is the breaker at the panel turned on?
- ✓ Is the Aux AC Control wire capped or connected to a solenoid valve or fuel management system?
- ✓ Is there power at pump? Check at junction box. Voltage cannot be below 104 volts on a 115V pump; 204 on a 230V pump.
- ✓ Is switch rod turning the switch on and off at the motor?
- ✓ Is motor overheated (thermal switch cutoff)? Be careful, the external motor surface could be hot enough to be painful or cause injury. Let cool and re-try.

! Replace motor if above checks do not solve the problem.

Pump hums but will not start.

- ✓ Is voltage adequate? Check voltage with pump on bypass with nozzle closed. Voltage cannot be below 104 volts on a 115V pump; 204 on a 230V pump.
- ✓ Is the Aux AC Control wire is capped or connected to a solenoid valve or fuel management system?
- ✓ Check rotor, vanes, and bypass valve for free operation. Check motor with rotor and vanes removed; shaft should turn easily and smoothly by hand. Spin shaft by hand clockwise, quickly start motor (hand clear of shaft) and observe shaft - shaft should stop clockwise motion and turn in a counterclockwise direction; if it does not, replace motor.

! Replace motor if above checks do not solve the problem.

Pump runs but will not prime or deliver product.

- ✓ Is there gas in tank?
- ✓ Do you have a nozzle with the anti-drain valve removed? (Must be able to blow air through the nozzle in the direction the fuel flows through it when the nozzle handle is held open.) Use GASBOY P/N 038519 for unleaded and 038520 for diesel.
- ✓ Loosen pump cover and slide aside so you can observe the rotor and vane movement inside the pump cavity. Rotor should be turning freely in a counter-clockwise motion. If rotor turns clockwise, motor is bad.
- ✓ If register is recording but no product is being dispensed, you may have a supply line air leak.
- ✓ Check for an air leak on suction side of pump. Is check valve seated properly? Reassemble and prime pump using liberal quantity of motor oil in pump cavity; if it primes, run pump full flow and snap nozzle closed; shut off motor and check for leak on suction side of pump above check valve. Any observed liquid leakage would indicate an air leak when pump is running with nozzle open and would prevent priming when pump was empty.
- ✓ Are bypass, strainer, and check valve cover plates flat? They could be bent from excessive pressure created by a vehicle running over the hose.
- ✓ Is there an air leak in the suction line below check valve. Make accuracy check using 5 gallon Seraphim test can. Any clock fast error (see **Inaccurate Delivery**) in excess of 2-1/2% indicates an air leak in the suction line. The most common source of an air leak in the suction line is the union - check union for alignment and tightness before checking balance of suction line. If pump does not prime using oil, suction line is blocked or has a severe air leak.

Pump delivers product but will not register.

- ✓ Is main totalizer recording? If yes, problem is in register assembly. Check to be sure the lever on the side of the register is returning back to the record position.
- ✓ If the main totalizer is not working, the problem is a broken or jammed measuring chamber.

Pump delivery is slow.

- ✓ Check for dirty strainer.
- ✓ If pump has a filter, change filter.
- ✓ An automatic nozzle will reduce flow rate about 25%. Check flow rate without nozzle or with standard nozzle. A farm type automatic nozzle (such as Husky 1GS swivel) provides the best flow.
- ✓ Check for supply line restriction by testing the pump with a vacuum gauge. If vacuum is abnormally high, there is a restriction.

Pump loses prime.

- ✓ Inspect check valve poppet and seat for clean mating surfaces.
- ✓ If after a period of non-use, a pump delivers product initially, followed by air and then full flow, there is an air leak in the suction line.
- ✓ Install pressure gauge between hose and nozzle. Operate pump at full flow. Snap nozzle closed and turn off pump. If pressure falls to zero rapidly, replace check valve and clean and inspect valve seat.

Inaccurate delivery.

- ✓ Calibrate the meter (See Section 4).

  A clock-fast error (more on the register than is delivered) in excess of 2-1/2% is due to air in the suction line or vaporization of gasoline in the pump. Check pump for loss of prime and suction line for air leak.

  A clock-slow condition may result from: any slowing of the register or measuring chamber due to excessive friction resistance or mechanical failure; inadvertent bypassing of the measuring chamber. Check register for zero setback; check reset lever return to top of slot in meter cover after setback; check for "hang-up" of number wheels in register or gears not meshing.

Pump delivers product when not turned on.

- ✓ In aboveground storage tank if fluid level is higher than pump, positive head pressure may force product through pump. Install a pressure regulating valve or a solenoid valve in the supply line to the pump.
- ✓ Check for defective vacuum breaker.

Vacuum breaker spits product

- ✓ Clean and replace. If problem persists, install return line kit.

DISASSEMBLY OF PUMP

*NOTE: Numbers in parentheses correspond to the numbers shown on the parts illustration and parts list in Section 6 labeled **Direct Drive Motor-Pump Assembly**.*

When the front panel is removed, all the working parts of the pump are accessible under clearly marked cover plates. Since pump may contain product, be prepared to catch product in an appropriate container when removing any cover.

Remove pump cover screws and remove cover plate (1) and square ring (2). Note orientation of rotor (4) and of vanes (36) in rotor slots. Remove key (3) and withdraw rotor and vanes from pump block (12). Since rotor is spring loaded, make sure washer (6) and spring (7) remain on pump shaft. Insert new rotor and replace vanes so that trailing edge slopes away from direction of pump rotation (counterclockwise). Reinstall key in shaft slot and rotor keyway. Check pump cover for scoring (if scored, replace). Replace square ring (2) and while holding rotor in against spring tension, slide cover over opening and tighten screws.

To replace shaft seal, remove rotor and vanes as above. Slide spring (7) and both washers (6) off shaft. O-ring (8) will act as a brake to resist removal of brass, rotating seal ring (9). To overcome this resistance, lightly grasp brass ring with pliers and pull at the same time turning shaft back and forth with the flat blade of a screwdriver in the keyslot in the end of the shaft. Remove O-ring from brass ring and spread some grease over machined surface of ring; reinsert brass ring over shaft and press greased surface against carbon, floating seal ring (10). The carbon ring can now be withdrawn stuck to the brass ring. Do not break up the carbon ring to remove it, since some of the pieces may get lost in the pump casting and cause the rotor or measuring chamber to jam later in service. Use a bent wire as a button-hook to hook and withdraw O-ring (11) from recess in back of pump cavity. Install new seal group (5) in reverse order. Make sure recess in back of pump cavity is clean and that O-ring (11) is firmly seated and not twisted in this recess.

NOTE It is critical that the seal part mating surfaces remain clean and dry. Do not touch or allow oil of any type to contaminate the carbon or brass mating surfaces. If the seal inadvertently becomes contaminated, both mating surfaces must be carefully cleaned with a lint-free cloth and methyl alcohol.

The bypass valve (29) is preset to provide maximum performance without overloading the motor and can be withdrawn by removing the bypass cover plate (31). When reassembling, make sure the holed end of the tube (32) and bullet-shaped nose of the valve (29) are inserted toward the pump.

The check valve is attached to the check valve cover (26) and will come out when the cover is removed. If you can hear the product in the suction line running back into the storage tank when this assembly (20) is removed, the check valve is holding and keeping the pump primed. When reassembling, make sure the rubber valve disc is facing down toward the valve seat.

METER-REGISTER DISASSEMBLY

*NOTE: Numbers in parentheses correspond to the numbers shown on the parts illustration and parts list in Section 6 labeled **1860 and 4860 Meter-Register**.*

The B size measuring chamber (5) can be removed for cleaning by taking out four meter body screws (2), lifting off register assembly (14) and removing three measuring chamber screws (4).

After separating and cleaning top and bottom half, reassemble, making sure baffle is seated in grooves in top and bottom halves and through slot in measuring disc (7). Do not drop or sharply strike chamber parts while handling. Rotate disc to make sure it turns freely and replace in meter body. Do not overtighten screws (4). A torque of 20-25 ft-lbs is sufficient. When reassembling register to meter body, use a new O-ring (3).

For calibration procedure, see **Meter Calibration** in Section 4.

1860 3-WHEEL REGISTER SERVICE AND MAINTENANCE

*NOTE: Numbers in parentheses correspond to the numbers shown on the parts illustration and parts list in Section 6 labeled **1860 3-Wheel Meter-Register**.*

To service or replace parts in the disc register, remove the self-tapping screws and lift off the front panel assembly. With the register now exposed, remove three screws with fiber washers (28 & 29). Lift off dial glass (30), and dial mask (32). This permits withdrawal of all parts (8 through 22). While removing parts, observe the position and relationship of the parts to each other to assist reassembly.

Totalizer assembly (3) can be taken out by removing screw (1). Replace as an assembly.

To gain access to the gear train (39, 40, 41 or 44 through 49), the register (1 through 33) can be removed as an assembly by taking out 4 screws and lifting it off the meter body. This is a liquid-carrying section of the meter. Be prepared to catch any liquid drained from the system at this point.

The cluster gear (40), controls the gear ratio change for gasoline or diesel fuel in U.S. or Imperial measure and is removed by taking off the retaining ring (38) and control block (39). For liter measure, the drive gear (41) controls this ratio, and the drive key (37) must be removed to replace this gear.

For full liter models, the cluster gear (45) controls the gasoline-diesel ratio change. To replace this gear, both the retaining ring (38) and drive key (37) must be removed, and gears (44, 49, 47, and 48) removed in that order.

Replacing Bearing and Seal Assembly (Item 36, Old Style)

To replace bearing and seal assembly (36), remove all gears in gear train (39, 40, 41) or (44, 47, 48, and 49). Do not lose spacer washer (43). Disassemble items 8-19 and 28-32 from register. Withdraw gear and shaft (27), bearing and seal assembly (36) and O-ring (35). Slide new O-ring (35) over bearing and seal (36) like a ring on a finger. Insert gear and shaft (27) through housing (33) from front to rear and through O-ring seal assembly (35 and 36). Press seal and shaft together to seat bearing and seal firmly into square cavity in back of housing. Reassemble in reverse order.

Replacing Bearing and Seal Assembly (Item 36, New Style)

To replace bearing and seal assembly (52), remove all gears in gear train (39, 40, 41) or (44, 47, 48 & 49). Do not lose spacer washer (43). Disassemble items 28-32 and 8-19 from register. Withdraw gear and shaft (27). Remove the nylon washer which is part of item 52 and note its location. Remove both oilite bearings and both O-rings from bore in register housing. Using new parts, which consist of a new nylon washer, 2 oilite bearings, and 2 O-rings, reassemble parts in reverse order. Be sure to lubricate both O-rings with an O-ring lubricant before assembling.

When assembling the disc register, observe the following precautions.

1. For full liter models, make sure the spacer washer (43) lies between the control block and gear (44) and the rear of the housing (33) on the control block post. The function of the remaining plate is to stabilize the shaft (27) and ensure full engagement of gears in the drive train (44-49).

   Reassemble the full liter train in the order 46, 45, 48, 47, 49, and 44. The gears drive in their number sequence (i.e. 44 drives 45, 45 drives 46, etc.).

2. A new drive key (37) is L-shaped as shown in drawing. After insertion through hole in shaft (27) and slot in gear (41 or 49) hub, the long leg of L must be bent up to form a U shape and capture the key and drive the gear train.

3. Hook spring (25) over post so that hook lies flat against rear of housing.

4. Make sure lower arm and overthrow stop pawl (19) fits into slot in reset lever.

5. To time the register for zero reset, pry apart the center wheel and (13 and 16) and place 16 on middle post with two red marks pointing toward the other two posts. Line up the red arrows on the lefthand and righthand wheels with marks on the center wheel as shown in drawing. Make sure pawls 15 and 17 remain in grooves of lefthand and center (16) reset gears (lefthand pawl-red, center pawl-white). Seat count gear (13) over hub of and down against reset gear (16). Listen to it snap into place.

6. Install righthand overthrow stop (19) on post with lower arm engaged in rectangular cutout in reset lever (24). Install center and lefthand overthrow stop (11) on post so that upper arm of 19 fits in the recess in 11 and both stops are driven simultaneously by reset lever (24) during reset.

7. If detent spring (21) and retainer (20) become separated, reassemble on post so that short leg of spring points toward top of register.

8. If all parts are removed from the register, reassemble in the reverse order in the following sequence: 27-35, 36, 41, 37, 40, 39, 38, 2, 3, 1, 26, 24, 25, 23, 22, 19, 16, 17, 14, 15, 12, 18, 13, 11, 21, 20, 10, 9, 8, 32, 31, 30, 29, 28.

9. Test register for zero reset (one short downward stroke of the reset lever resets register to zero) and turn control block (39) by hand to record at least one gallon on the register. Make sure O-ring seal on the rear of the housing is clean and the O-ring (34) is free of nicks or cuts and will lay flat within the seat. Reassemble the meter to the register.

4860 4-WHEEL REGISTER SERVICE

*NOTE: Numbers in parentheses correspond to the numbers shown on the parts illustration and parts list in Section 6 labeled **4860 4-Wheel Register**.*

To service push button register, remove two (one on each side) screws (2) from bezel (1). Remove bezel and dial mask (4). Reset button (5) and spring (6) are released when the dial mask is removed. Remove screws (7), reset bearing (8) and screws (11) to lift register assembly (10) out. Drive shaft assembly (12) can be removed by taking out four bearing screws.

Replacing Bearing and Seal Assembly (Item 16, Old Style)

To replace the shaft seal or service the gear train on back of register housing (18), remove housing from meter body by taking out four screws. *NOTE: The meter housing will be full of liquid so some means should be available to catch what drains from the case and lines.* To remove gears (22-25), remove three retaining rings (20) and drive key (21). Withdraw the drive shaft and gear (14), spacer (15), meter stuffing box (16), and O-ring (17). Slide new O-ring over new bearing seal like you would slide a ring on your finger. Insert shaft (14) through spacer (15) and bearing (16) as shown in the exploded view. Press entire assembled shaft and seal through housing and seat the square of the bearing firmly into the recess in the register housing (18). Reassemble the balance of the register in reverse order of disassembly.

Replacing Bearing and Seal Assembly (Item 26, New Style)

To replace the bearing and shaft seal assembly (26), or service the gear train on back of register housing (18), remove housing from meter by taking out four screws. *NOTE: The meter housing will be full of liquid so some means should be available to catch what drains from the case and lines.* To remove gears (22-25), remove three retaining rings (20) and drive key (21). Withdraw the drive shaft and gear (14), spacer (15), and all parts of bearing and seal assembly (26). Remove the nylon washer from item 26 and note its location. Remove both oilite bearings and both O-rings from bore in register housing. Using new parts, which consist of a new nylon washer, 2 oilite bearings, and 2 O-rings, reassembly parts in reverse order. Be sure to lubricate both O-rings with an O-ring lubricant before assembling.

Reassemble gear train in following sequence: gear (25), key (21), cluster gear (24), retaining ring (20), control block (22), and retaining ring (20).

Section 6

PARTS

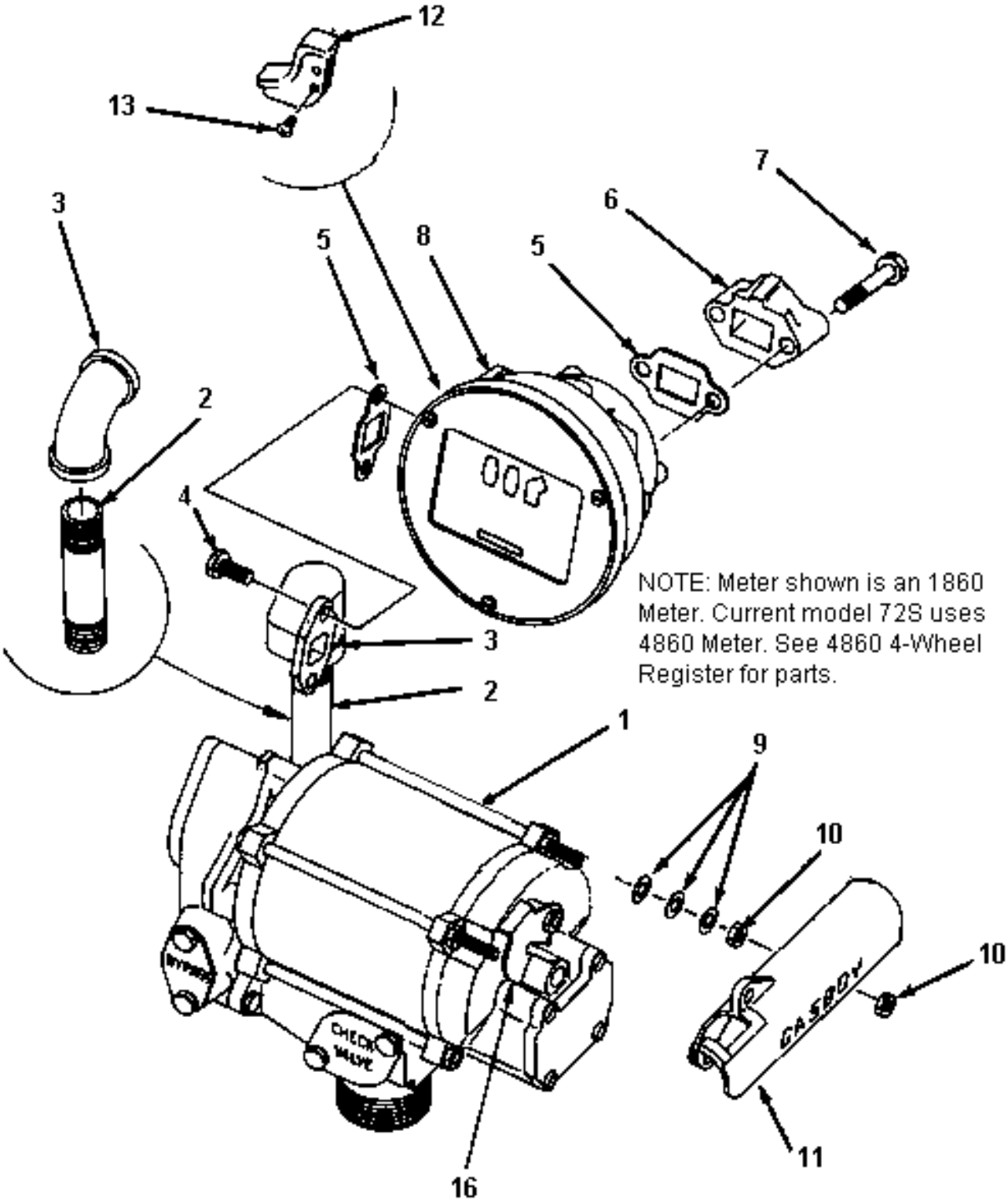
Using part numbers when ordering will expedite your order and reduce the possibility of the wrong parts being shipped. When ordering replacement parts, be sure to give the complete name and part number as shown in the appropriate parts lists.

Procedures requiring disassembly of portions of the pump should be performed by competent service personnel. Do not depend upon the repair service of a general mechanic unless he is thoroughly familiar with the mechanism. GASBOY has a distributor network which services fuel dispensing equipment and management systems in every section of the country.

WARNING:

To reduce the risk of electrical shock when servicing, turn off and lock out all power to the pump.

SERIES 70 ASSEMBLY



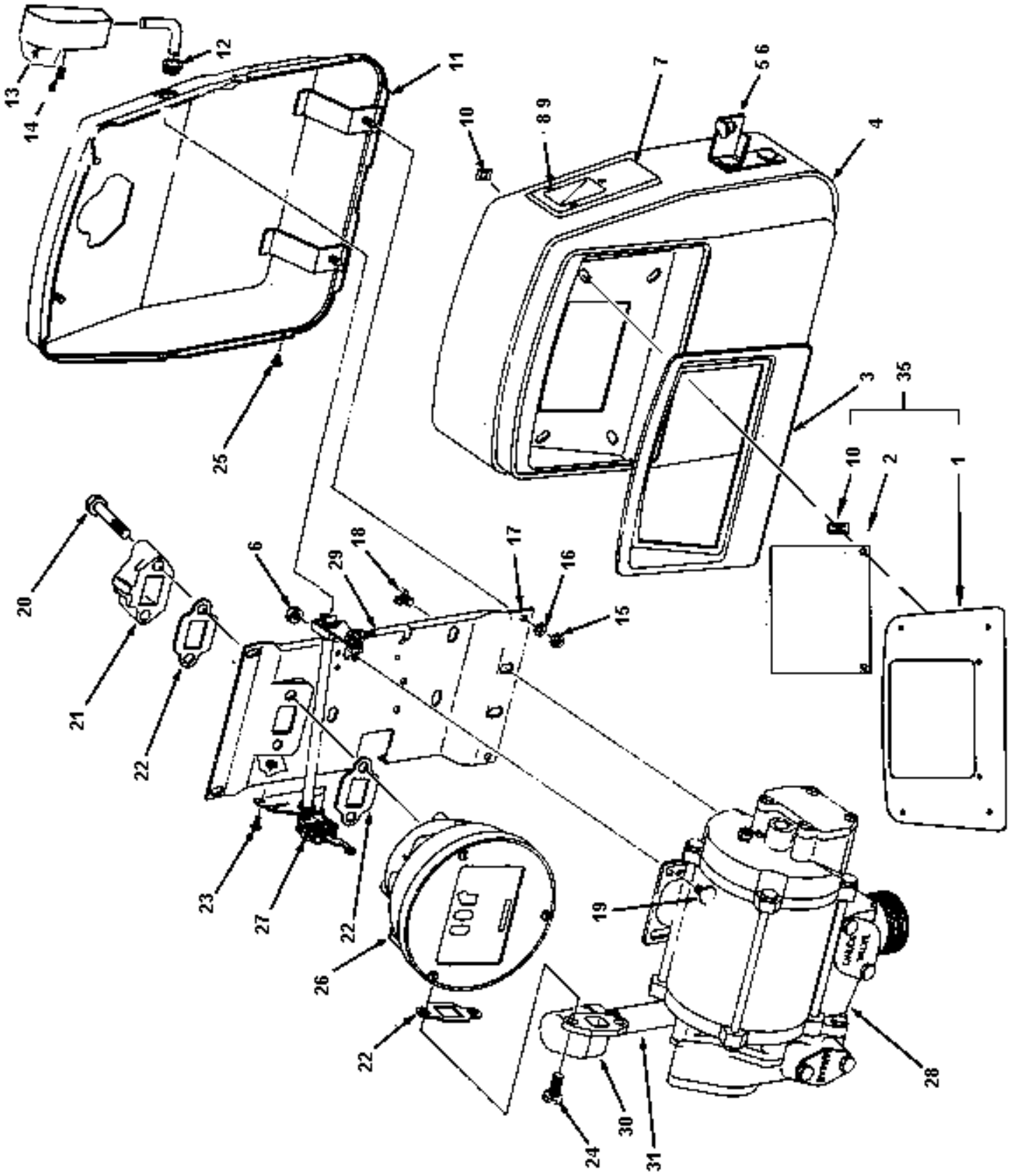
SERIES 70 ASSEMBLY

Item	Part No.	Description
1		Pump Assembly *(See Direct Drive Motor Parts List)*
2	R11496 106	3/4-inch X 6-7/8-inch Pipe Nipple
3	003597	Flanged Inlet, 72S
	024934	Elbow, 72X & 73
4	K47659	Screw 3/8 -16 X 7/8 LG
5	M05618B001	Gasket
6	003542	3/4-inch Horiz. Dschg for Vacuum Breaker
	003544	1-inch Horiz. Dschg for Vacuum Breaker
7	K04395	Screw 3/8 -16 X 2 LG
8		Meter Register Assy *(See breakdown for your model)*
9	K65235 33	Washer
10	Q12068 06	Hex Nut WITH LOCKWASHER
11	000325	Nozzle Boot
12	029410	Reset Lever Handle (only used with Vapor Recovery)
13	053900	Reset Lever Screw (only used on Model 72)
14	030605	Hose, ¾-inch x 12 ft. (Not Shown)
15	038471	Nozzle, ¾-inch EBW-unleaded.(Not Shown)
16	034121	Motor Switch Lever (old style units)
17	066534	Vacuum Breaker (Not Shown)

OPTIONAL ACCESSORIES

PART	DESCRIPTION	PART	DESCRIPTION
032814	Filter Kit (1820/1820R) (Contains * items shown below)	038471	Nozzle - 3/4-inch Manual-Unleaded
*K02297	Bushing, 3/4-inch x 1-inch	038475	Nozzle - 3/4-inch Manual- Leaded
*R11496 23	Pipe tube, 3/4-inch x 2-inch	038519	Nozzle-Automatic-Unleaded-Husky
*003043	Adapter, Filter 3/4-inch	038520	Nozzle-Automatic-Leaded-Husky
*024940	Elbow, street 3/4-inch x 90	038510	Hook Assy., OPW 11A
*026005	Filter, Wix 24006 dsl/gas	038511	Hook Assy., EMCO A2000
030565	Hose-3/4-inch x 15 ft.	038503	Hook Assy., OPW 7H
030566	Hose-1-inch x 15 ft.	032700	Kit, Vacuum Breaker Tubing and Fittings

SERIES 1820 ASSEMBLY



SERIES 1820 ASSEMBLY

Item	Part No.	Description
1	025393	Dial Face Assembly
2	028850	Dial Glass
3	012265	Bezel
4	040630	Front Panel Assembly
5	029620	Nozzle Hanger
	029590	Nozzle Hanger - Automatic Nozzle
6	Q12068 06	Keps Lock Nut
7	003820	Scuff Plate
8	052856	Machine Screw
9	Q12068 03	Keps Lock Nut
10	039461	Speed Nut
11	041545	Rear Panel Assembly
12	039815	Nyliner Bearing
13	003717	Control Lever
14	053170	Set Screw
15	038860	1/4-20 Hex Nut
16	068891	1/4 Lock washer
17	063970	Pump and Meter Support
18	Q10624 13	Cap Screw
19	013030	Carriage Bolt
20	K04395	Machine Screw, 3/8-16 X 2
21	003542	Horiz. Dischg-3/4-inch, for vac breaker
	003544	Horiz. Dischg-1-inch, for vac breaker
	003645	Horiz. Dischg, 1820R

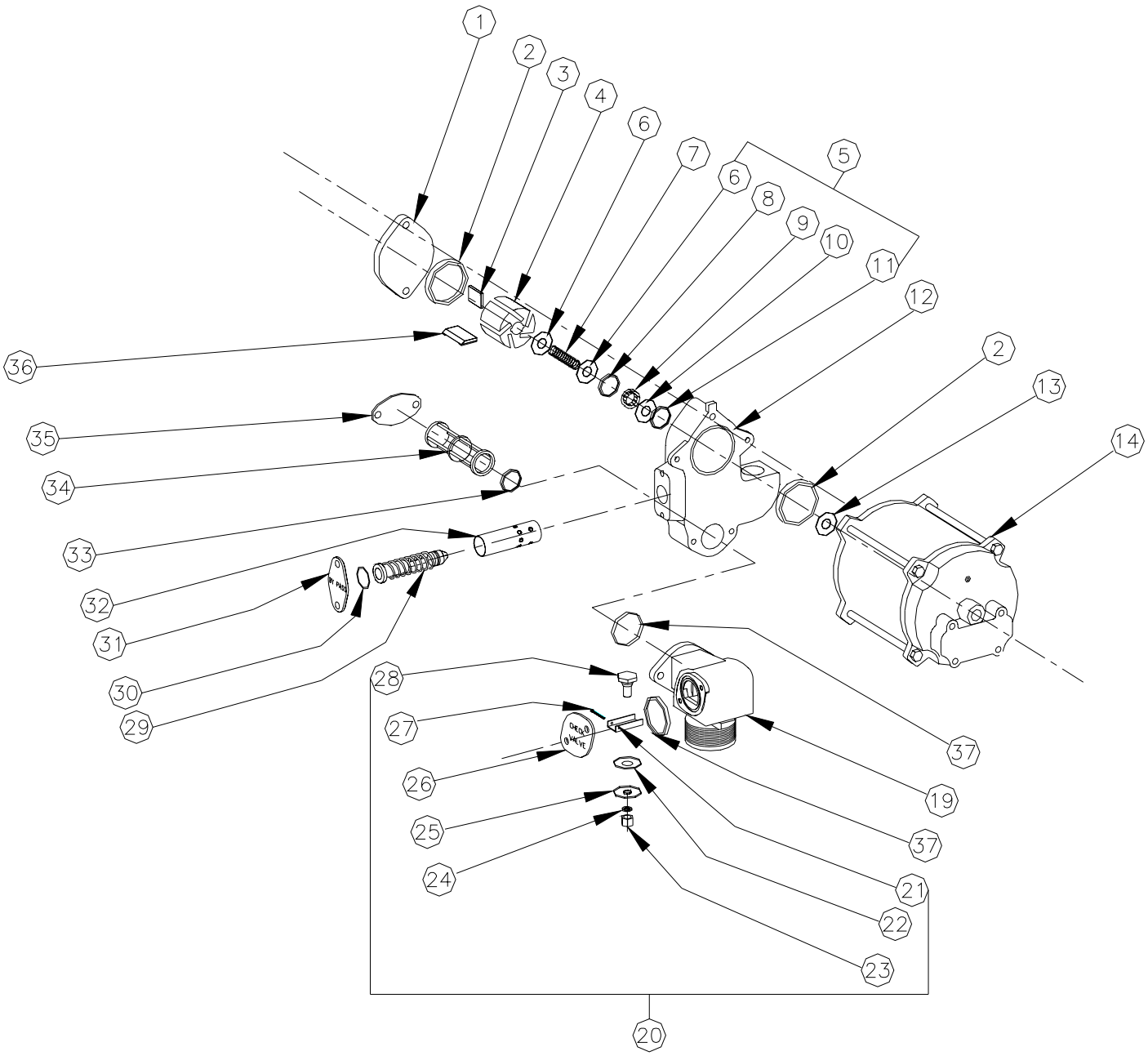
Item	Part No.	Description
22	M05618B001	Gasket
23	Q11560 53	Machine Screw
24	K47659	Cap Screw
25	053725	Self-Tapping Screw
26		Meter-Register Assy. *(See breakdown for your model)*
27	054654	Control Shaft Assy. *(See breakdown)*
28		Direct Drive Motor Assy *(See **Direct Drive Motor** parts breakdown)*
29	051206	Switch Rod Assembly *(See breakdown)*
30	003597	Flanged Inlet, (72S & 1820)
	003601	Flanged Inlet, (1820R)
31	R11496 106	3/4-inch x 6-7/8 Nipple
32	030605	Hose-3/4-inch x 12 ft., (Not shown)
33	038471	Nozzle-Manual Unl, (Not Shown)
35	032912	Dial Face Kit (consists of items 1, 2, & 10)
36	066534	Vacuum Breaker (Not Shown)

OPTIONAL ACCESSORIES

PART	DESCRIPTION
032814	Filter Kit (1820/1820R) (Contains * items shown below)
*017270	Bushing, 3/4-inch x 1-inch
*R11496 23	Pipe tube, 3/4-inch x 2-inch
*003043	Adapter, Filter 3/4-inch
*K21703	Elbow, street 3/4-inch x 90
*026005	Filter, Wix 24006 dsl/gas
030565	Hose-3/4-inch x 15 ft.
030366	Hose-1-inch x 15 ft.

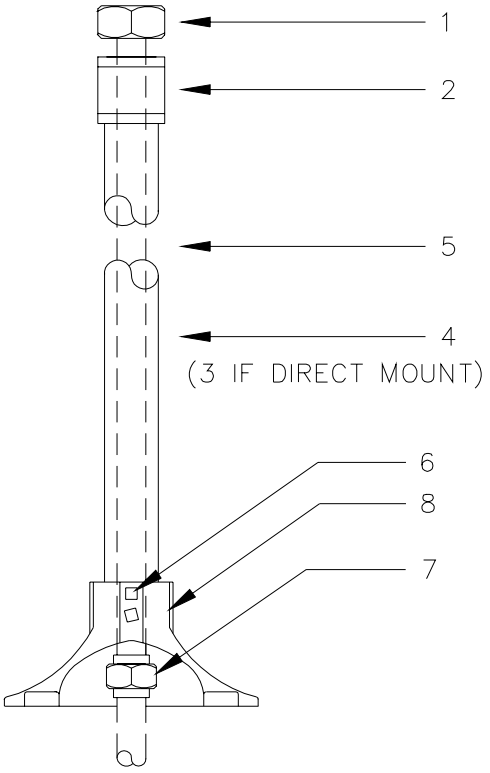
PART	DESCRIPTION
038471	Nozzle - 3/4-inch Manual-Unleaded
038475	Nozzle - 3/4-inch Manual- Leaded
038519	Nozzle-Automatic-Unleaded-Husky
038520	Nozzle-Automatic-Leaded-Husky
038510	Hook Assy., OPW 11A
038511	Hook Assy., EMCO A2000
038503	Hook Assy., OPW 7H

DIRECT DRIVE MOTOR-PUMP ASSEMBLY



DIRECT DRIVE MOTOR-PUMP ASSEMBLY

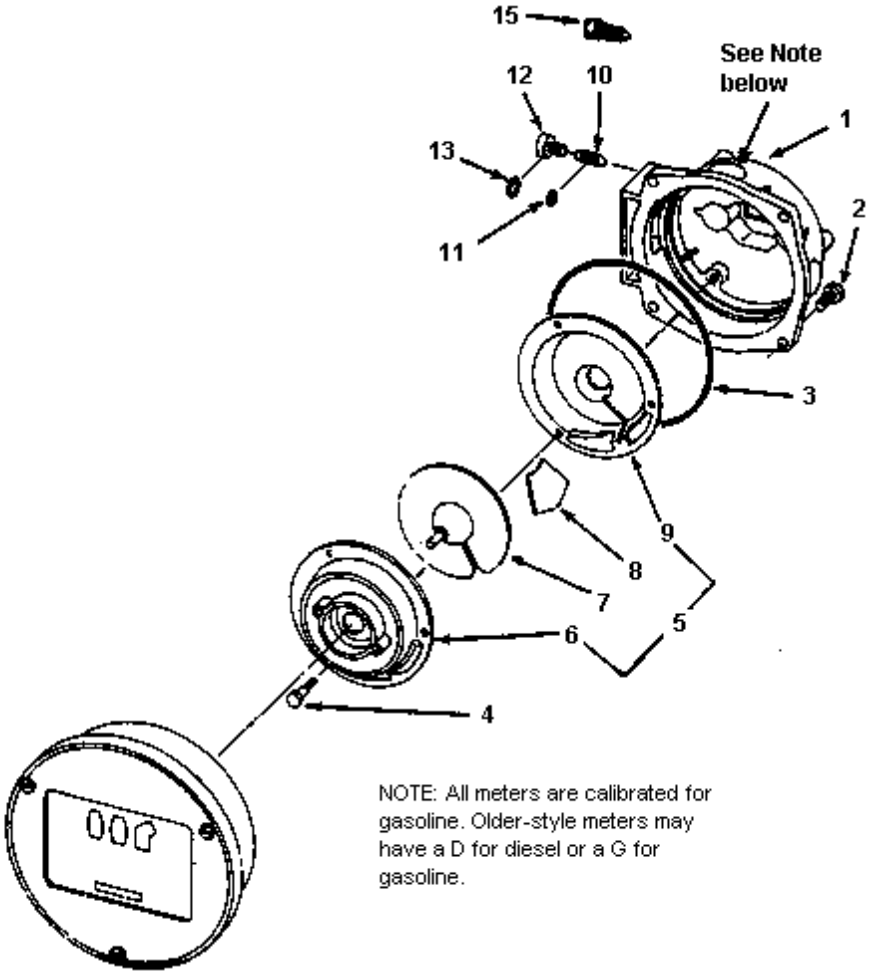
Item	Part No.	Description
1	003490	Pump Cover
2	049004	Square-Ring
3	031285	Key, 70
4	051475	Rotor
5	054024	Seal Group (Consists of items 6-11)
6	067210	Washer
7	057956	Spring
8	048941	O-Ring
9	049510	Rotating Seal Ring
10	048820	Floating Seal Ring-Carbon
11	048956	O-Ring
12	003210	Pump Block
13	049525	Slinger Ring
14	F37332	Motor, 115V, 60 cycle, 70
	F37697	Motor, 115V, 60 cycle, 1800
	F37616	Motor, 230V, 50 cycle, 70
	F37461	Motor, 230V, 50 cycle, 1800
19	003065	Base
20	066655	Check Valve Assembly (Consists of items 21-25 & 28)
21	029155	Valve Guide
	029005	Valve Guide, 1800R
22	068680	Washer
23	038980	Hex Jam Nut
24	068650	Washer
25	024356	Valve Disc
26	022271	Check Valve Cover Assy.
27	042370	Cotter Pin
28	062620	Valve Stem w/Relief Valve
	*062365	Relief Valve
29	062335	By-Pass Stem Assy.
30	049001	Square Ring
31	022315	By-Pass Cover
32	065725	Tube
33	049002	Square-Ring
34	063268	Strainer, 100 Mesh, Gasoline
	063266	Strainer, 30 mesh, Diesel
35	022900	Strainer Cover
36	067030	Vane
37	049003	Square-Ring



INSTALLATION PARTS

Item	Part No.	Description
1	003835	Install-a-Socket
2	021970	2-inch Coupling
3	045010	2-inch x 40-inch Pipe (underground)
4	045535	2-inch x 30-inch Pipe (pedestal)
5	R11495 108	1-inch x 32 1/2-inch Suction Pipe
6	053320	Set Screws
7	K07797	1-inch Union
8	003055	Pedestal Base

1860 AND 4860 METER-REGISTER



Item	Part No.	Description
1	012790	Meter Body
2	K43625	Meter Body Screw
3	049075	O-Ring
4	025851	Screw
5	019016	Meas. Chamber Assy. (sold as assembly only; includes items 6-9)
	019015	Bronze Meas. Chamber
6		Meas. Chamber Top
7		Measuring Disc
8		Baffle
9		Meas. Chamber-bottom
10	053080	Adjusting Screw (Old Style)
11	048865	O-Ring, Buna
	048866	O-Ring, Viton
12	052195	Adjusting Screw, Cap
13	048895	O-Ring
14		Register Assembly *(See below for list)*
15	053081	Adjusting Screw (New Style; replaces items 10-12)

REGISTER ASSEMBLIES

Compatible with new- or old-style adjusting screw design

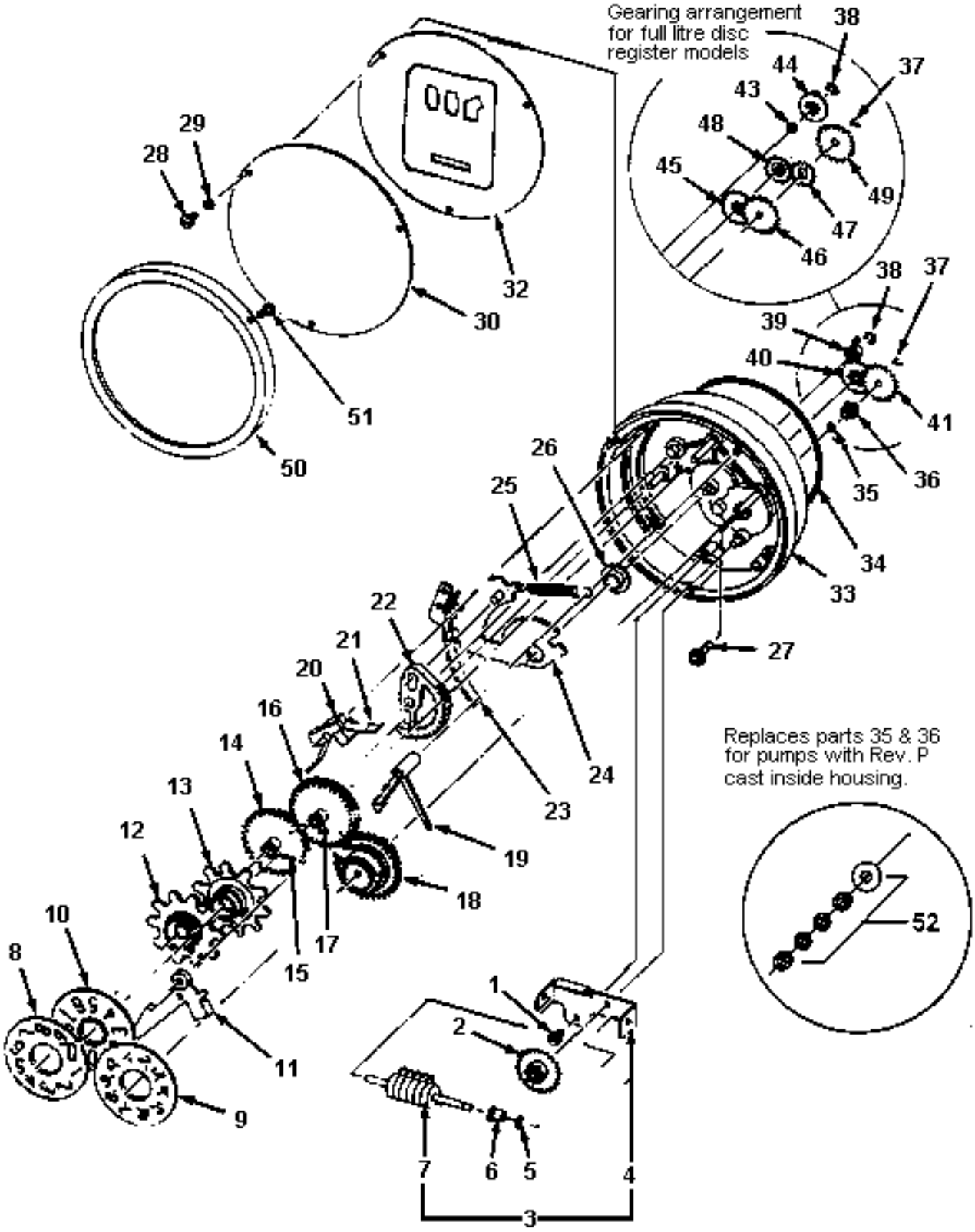
3-Wheel Disc Register (Shown Above)
(Phenolic Chamber)

035963	US Gallons, Gas
035964	US Gallons, Diesel
036293	Full Liter, Gas
036130	Full Liter, Diesel
048478	1/10 Liter, Gas

4-Wheel Push-Button Register (Not Shown)
Phenolic Chamber

036400	US Gallons, Gas
036401	US Gallons, Diesel
036404	Liter, Gas
036405	Liter, Diesel

1860 3-WHEEL METER REGISTER (FOR MODEL 1820)



1860 3-WHEEL METER REGISTER (FOR MODEL 1820)

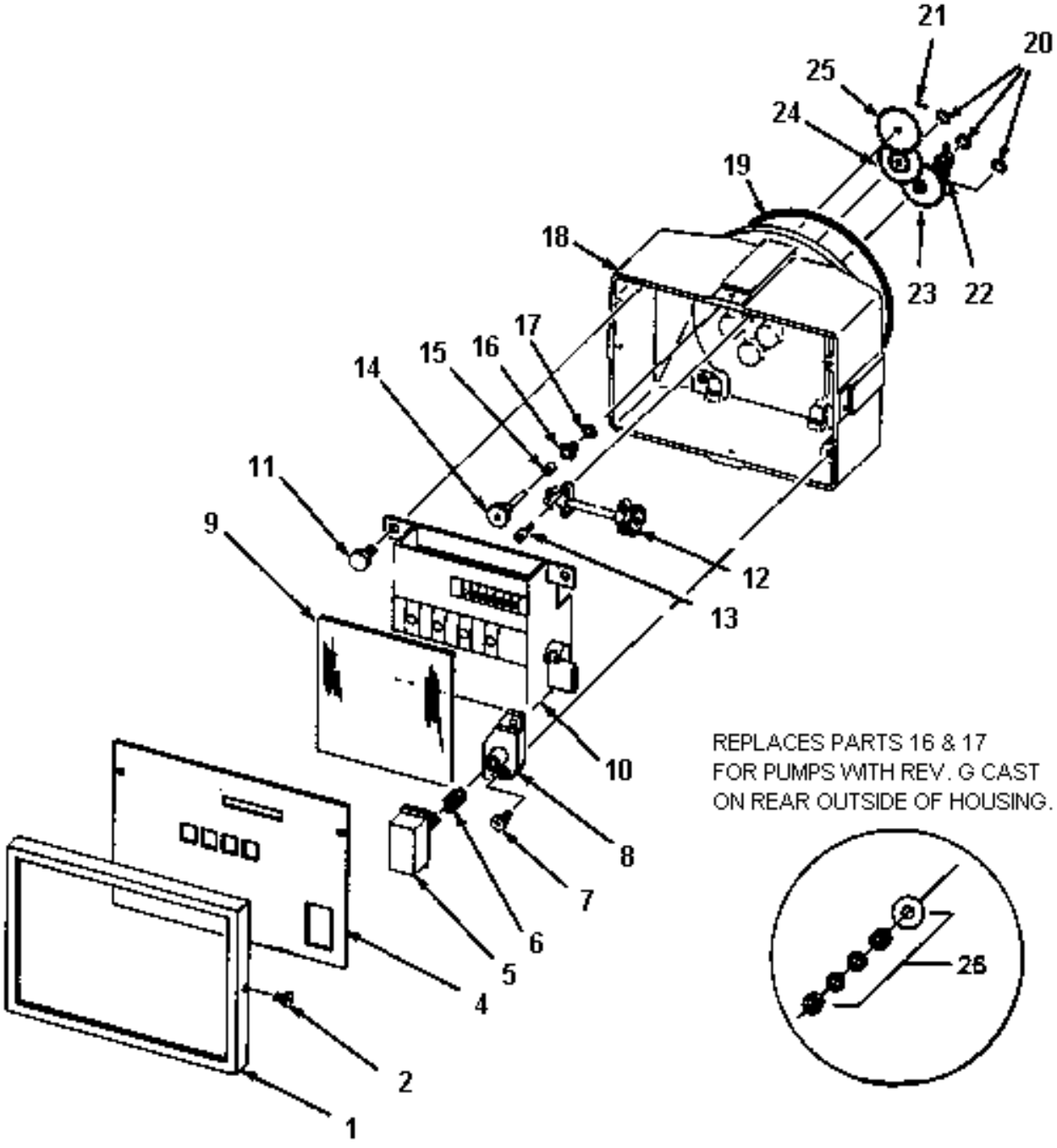
035634 US Measure
035640 Liter Measure, 1/10
036296 Liter Measure, Full

Item	Part No.	Description
1	Q11270 351	Screw
2	028615	Totalizer Drive Gear
3	065305	Totalizer Assembly (items 4-7. Not sold separately.)
8	024280	L H Number disc
9	024310	R H Number disc
10	024220	Center Number disc
11	063220	Overthrow stop center & L H Wheels
12	028225	L H Count Wheel
12A	068994	L H Wheel Assembly (Includes items 12, 14, 15)
13	027580	Center Count Wheel
13A	068993	Center Wheel Assembly (Includes items 13, 16, 17)
14	028245	L H Reset Gear
15	042070	L H Reset Pawl
16	027600	Center Reset Gear
17	042040	Center Reset Pawl
18	068995	Wheel and Clutch Assembly
19	042055	Overthrow Stop Pawl
20	048805	Detent Spring Retainer
21	057580	Detent Spring
22	054325	Reset Sector Gear
23	056425	Reset Lever Shoe
24	033822	Reset Lever
25	057895	Reset Lever Spring
26	012085	Reset Lever Bearing
27	054955	Register Drive Gear & Shaft
28	Q11270 351	Dial Mask Screw
29	067780	Fiber Washer
30	028780	Dial Glass
32	035394	Dial Mask US Gallons & Imperial Gallons
	035380	Dial Mask, Liter, Tenths
33	022675	Register Housing
34	049075	O-Ring
35	048865	O-Ring
36	014095	Bearing and Seal Assy. (Use only when Rev K is cast inside of housing #33 If other Rev., see item 52.)
37	031345	Drive Key
38	049390	Retaining Ring
50	012250	Bezel (70 series)
51	Q11769 02	Bezel Screw (70 series)
52	036995	Bearing & Seal Assy. (Use only when Rev P is cast inside of housing #33 If other Rev., see item 36.)

*NOTE: Due to meter redesign, meters manufactured after May 10, 1995 use the **New Style** change gears. Older meters use the **Old Style** change gears.*

Item	Part No.	Description
CHANGE GEARS-U.S. GALLONS (New Style) Gasoline or Diesel		
39	012491	Control Block, 12T
	012490	Control Block, Bronze, 12T
40	028129	Cluster Gear, 32T-11T
41	028448	Drive Gear, 36T
CHANGE GEARS-U.S. GALLONS (Old Style)		
39	012491	Control Block, 12T
	012490	Control Block, Bronze, 12T
40	027715	Cluster Gear, Gas, 33T-11T
	027655	Cluster Gear, Dsl, 34T-11T
41	028448	Drive Gear, Gas, 36T
	028450	Drive Gear, Dsl, 37T
CHANGE GEARS-IMPERIAL GALLONS		
39	012491	Control Block, 12T
	012490	Control Block, Bronze, 12T
40	027670	Cluster Gear, Gas, 34T-10T
	027685	Cluster Gear, Dsl, 35T-10T
41	028465	Drive Gear, Gas, 38T
	028480	Drive Gear, Dsl, 39T
CHANGE GEARS-LITERS, TENTHS (New Style) Gasoline or Diesel		
39	012505	Control Block, 26T
40	027705	Cluster Gear, Gas, 18T-11T
41	028448	Drive Gear, Gas, 36T
CHANGE GEARS-LITERS, TENTHS (Old Style)		
39	012505	Control Block, 26T
40	027705	Cluster Gear, Gas, 18T-11T
	027700	Cluster Gear, Dsl, 19T-11T, 1820S only
41	028448	Drive Gear, Gas, 36T
	028465	Drive Gear, Dsl, 38T
CHANGE GEARS-LITERS, FULL (999 LITERS)		
3	065309	Totalizer Assembly (All Black Wheels)
9	024315	R H Number disc (Full Liter)
27	053318	Register Drive Gear & Shaft
32	035381	Dial Mask (Full Liter)
43	N16599 122	Spacer Washer
44	012491	Control Block, 12T
	012490	Control Block, Bronze, 12T
45	028129	Cluster Gear, Gas, 32T-11T
	027655	Cluster Gear, Dsl, 34T-11T
46	028229	Gear, 38T
47	028230	Gear, 24T
48	028231	Cluster Gear, 14T-25T
49	028232	Drive Gear, Gas, 34T
	028228	Drive Gear, Dsl, 35T

4860 4-WHEEL REGISTER (FOR MODEL 72S AND SERIES 1820R)



4860 4-WHEEL REGISTER (FOR MODEL 72S AND SERIES 1820R)

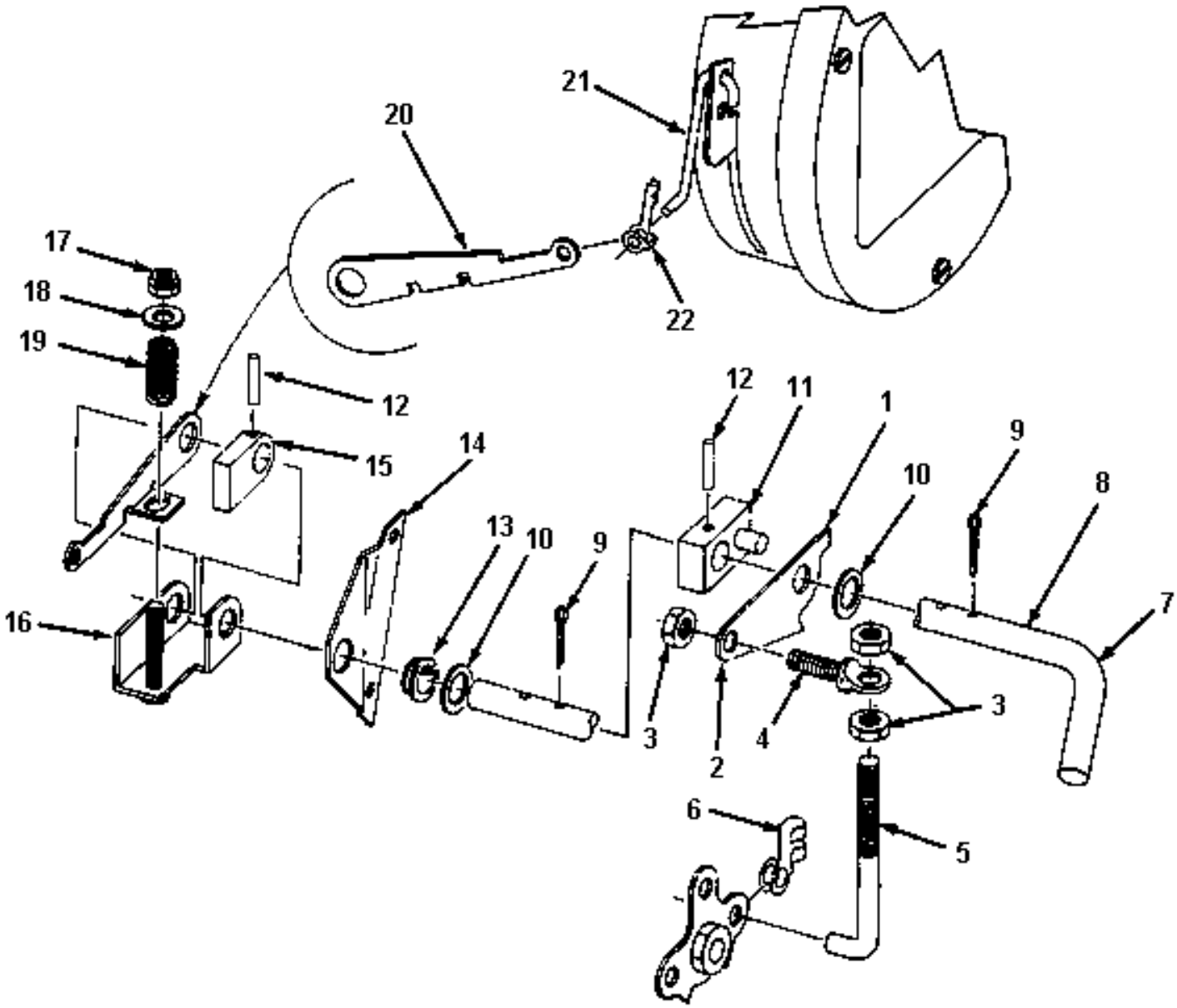
036341 U.S. Measure, 72S
036343 Liter Measure, 72S
036345 Imperial Measure, 72S

036357 US Measure, 1820R
036361 Liter Measure, 1820R
036353 US Measure, Ext. Shaft, 1820R
036373 Liter Measure, Ext. Shaft, 1820R

Item	Part No.	Description
1	012236	Bezel
	012267	Bezel, 1820R
2	053625	Bezel Screw
4	035309	Dial Mask
	035307	Dial Mask, 1820R
5	017269	Reset Button
6	057985	Spring, setback
7	053737	Reset Bearing Screw
8	011816	Reset Bearing
9	028736	Dial Glass
10	S00758	Register Assembly (incl glass)
	S00765	Reg Assy, Ext Shaft (incl glass)
11	K85736 55	Register Screw
12	054513	Drive Shaft Assy
13	053626	Drive Shaft Assy Screw
14	054522	Drive Shaft and Gear
15	056791	Spacer
16	014095	Bearing and Seal Assy. (Use if no letter is cast onto rear of housing #18. If Rev. G, see item 26.)
17	048865	O-Ring
18	031020	Register Housing
	048426	Register Housing, 1820R
19	049075	O-Ring
20	049390	Retaining Ring - E
21	031345	Drive Key - Spring
26	036995	Bearing & Seal Assy. (Use only when Rev G is cast onto rear of housing #18. If no Rev. see item 16.)

*NOTE: Due to meter redesign, meters manufactured after May 10, 1995 use the **New Style** change gears. Older meters use the **Old Style** change gears.*

Item	Part No.	Description
CHANGE GEARS-US GALLONS (New Style) Gasoline or Diesel		
22	012491	Control Block,12T
	012490	Control Block, Bronze, 12T
23	028168	Cluster Gear, 12T-39T
24	028172	Cluster Gear, Gas, 15T-38T
25	028448	Drive Gear, 36T
CHANGE GEARS-U.S. GALLONS (Old Style)		
22	012491	Control Block,12T
	012490	Control Block, Bronze, 12T
23	028168	Cluster Gear, 12T-39T
24	028172	Cluster Gear, Gas, 15T-38T
	028173	Cluster Gear, Dsl, 15T-39T
25	028450	Drive Gear, Gas, 37T
	028465	Drive Gear, Dsl, 38T
IMPERIAL GALLONS (New Style)		
22	012491	Control Block,12T
	012490	Control Block, Bronze, 12T
23	028168	Cluster Gear, 12T-39T
24	028449	Gear, 37T
25	028174	Cluster Gear, 13T-39T
IMPERIAL GALLONS (Old Style)		
22	012491	Control Block,12T
	012490	Control Block, Bronze, 12T
23	028168	Cluster Gear, 12T-39T
24	028174	Cluster Gear, 13T-39T
25	028449	Gear, Gas, 37T
	028163	Drive Gear, Dsl, 39T
LITER MEASURE (New Style) Gasoline or Diesel		
22	012491	Control Block,12T
	012490	Control Block, Bronze, 12T
23	028172	Cluster Gear, Gas, 15T-38T
24	028175	Cluster Gear, 29T-36T
25	028151	Drive Gear, Dsl, 25T
LITER MEASURE (Old Style)		
22	012491	Control Block, 12T
	012490	Control Block, Bronze, 12T
23	028172	Cluster Gear, Gas, 15T-38T
	028173	Cluster Gear, Dsl, 15T-39T
24	028175	Cluster Gear, 29T-36T
25	028171	Drive Gear, Dsl, 26T
	028151	Drive Gear, Gas, 25T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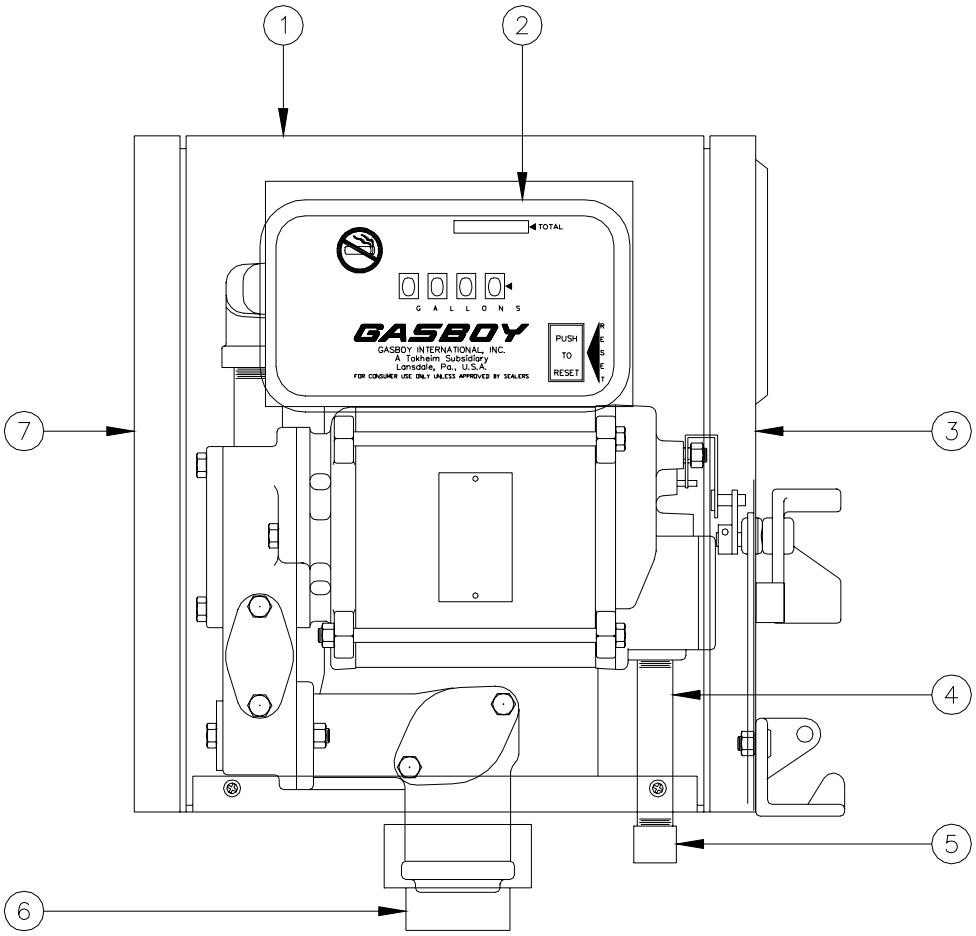
MODEL 1820 REGISTER SETBACK AND SWITCH LINKAGE ASSEMBLY PARTS LIST

Item	Part No.	Description
1	051206	Switch Rod Assembly (consists of items 2-5)
2	034155	Switch Lever, 1800
3	038905	Hex Lock Nut
4	051730	Adjusting Screw
5	050755	Switch Rod
6	021040	Throttle Clip - L H
7	054654	Control Shaft (consists of items 8-20)
8	054610	Control Shaft
9	K02125	Cotter Pin
10	068635	Washer
11	012520	Drive Block Assembly
12	K53911	Driv-Lok Pin
13	039815	Nyliner Bearing
14	011870	Shaft Bracket
15	012641	Drive Block, Reset
16	024776	Reset Arm Driver Assy.
17	038875	Hex Nut
18	067270	Washer
19	057925	Spring Reset
20	010827	Reset Arm
21	034804	Reset Link
22	020935	Throttle Clip - R H

OPTIONAL KITS FOR SERIES 70 AND 1800 PUMPS

PART	DESCRIPTION
032765	Kit, Wall-Mount 1820/1820R
032712	Kit, Filter - 1820 (For use with wall mount kit 032765)
032814	Kit, Filter 1820/1820R Diesel/Gas
032888	Kit, Repair 70/1800
032701	Kit, Vacuum Breaker 1820R
032700	Kit, Vacuum Breaker Tubing and Fittings (Does not include Vacuum Breaker)
047575	Kit, Vapor Recovery (72VR)
032889	Register Rebuild Kit, 1860
033026	Register Rebuild Kit, 4860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GALLONS
GASBOY
GASBOY INTERNATIONAL, INC.
A Tokheim Subsidiary
Lansdale, Pa., U.S.A.
FOR CONSUMER USE ONLY UNLESS APPROVED BY SEALERS
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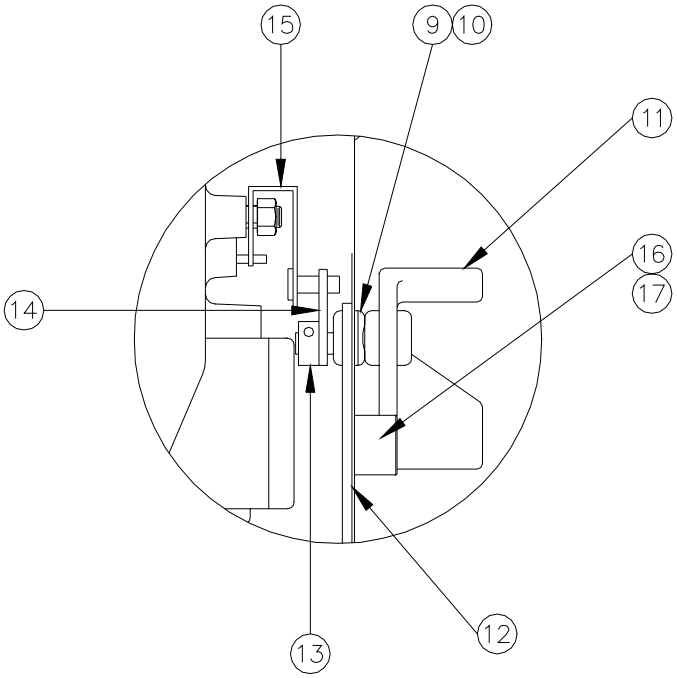
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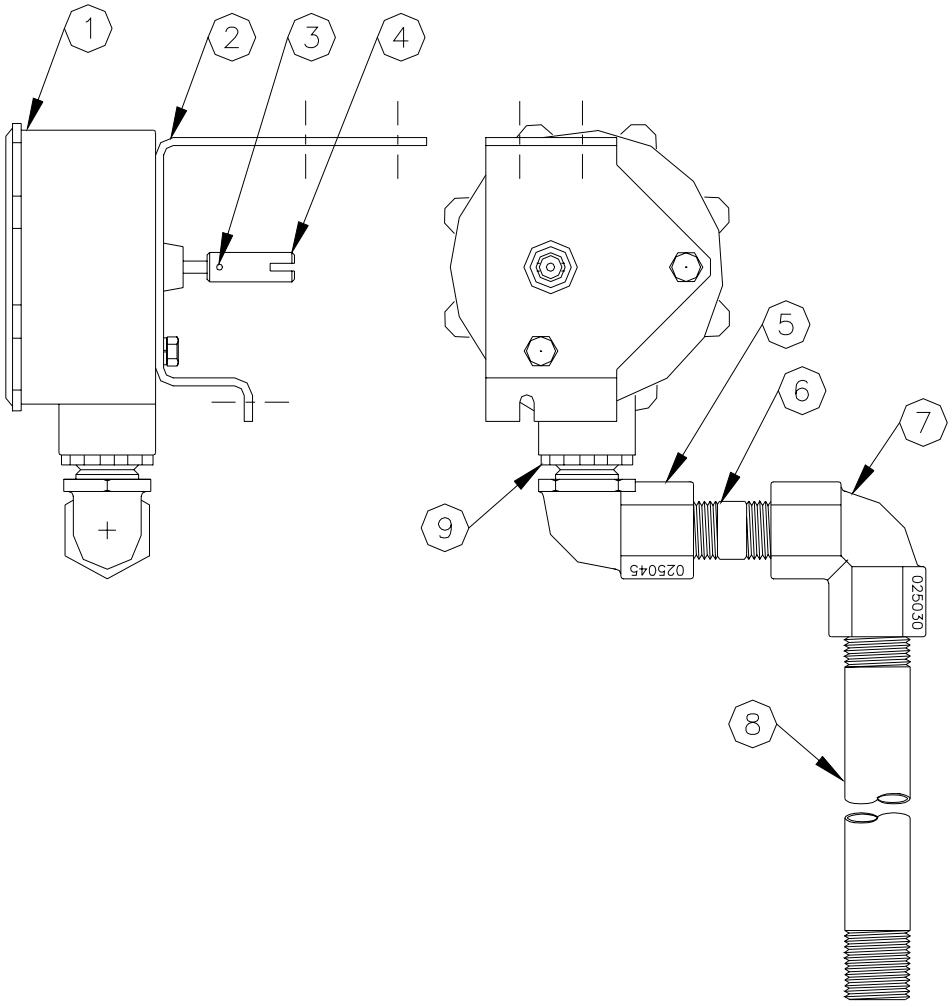
MODEL 1820R PARTS LIST

Item	Part No.	Description
1	022194	Cover-1820R, CRS
	022971	Cover-1820R, SS
2	012267	Bezel
3	M04560A001	Panel Assy.-Right, CRS
	M04560A002	Panel Assy.-Right, SS
4	021374	Conduit 1/2 x 5
5	017931	Thread Protector 1/2-inch MNPT
6	003835	Install-a-Socket
7	M04559A001	Panel Assy-Left, CRS
	M04559A002	Panel Assy-Left, SS
	M04559A003	Panel Assy-Left, CRS, Pulser
	M04559A004	Panel Assy-Left, SS, Pulser
8	M04558B001	Panel-Back, CRS (Not Shown)
	M04558B002	Panel-Back, SS (Not Shown)
9	K65235 33	Washer - 5/16 plated
10	068281	Washer - Spring 7/16
11	051072	Switch Arm Assy.
12	M04610A001	Frame Assy
13	053516	Set Screw, Soc Hd., 10-32x1/4 HF
14	M04446A002	Cam Assy.
15	033748	Switch Actuator Assy.
16	063209	Eccentric Stop
17	052314	Flathead Screw

1820R PULSER AND JUNCTION BOX ASSEMBLIES



Item	Part No.	Description
1	021788	Pulser, 10:1
2	014646	Bracket Pulser
3	043211	Spirol Pin
4	021943	Pulser Coupling
5	025045	Elbow, ½ x 90 M/F
6	021532	Conduit, ½ x 1-3/4
7	025030	Elbow, ½ x 90 F/F
8	021378	Conduit, ½ x 9-1/2
9	039130	Conduit Locknut

ITEMS NOT SHOWN

003340	Junction Box
003515	Junction Box Cover
067500	Washer, Brass Cupped
052976	Screw, 10-32 x 3/8 slotted ground

GASBOY WARRANTY POLICY STATEMENT

(Limited Warranty)
New Product WARRANTY

GASBOY GUARANTEES NEW SERVICE STATION EQUIPMENT MANUFACTURED BY GASBOY IN ACCORDANCE WITH THE PROVISIONS STATED BELOW:

Gasboy will repair or replace parts and equipment found to be defective in materials or workmanship during the warranty period, subject to the following:

- Labor and travel costs incurred by the Authorized Service Contractor (ASC) while servicing Gasboy equipment are included, unless excepted, and will be paid at previously contracted rates to the qualified ASC.
- Warranty services must be performed by the nearest Authorized Service Contractor qualified to perform service on the defective equipment.
- Gasboy will supply new or rebuilt parts to replace parts which are found to be defective within the warranty period. Parts returned to Gasboy must be shipped with transportation charges paid and will be replaced with parts with transportation charges prepaid by Gasboy.
- New Equipment installations must be registered with the Gasboy Call Center within 24 hours of installation to receive full warranty benefits; otherwise, the warranty period commences at the date of invoice.
- Warranty service response time is 24 hours from time service is requested, Monday through Friday (8:00 am until 5:00 pm), excluding weekends. Emergency warranty response time is on-site within 4 hours. Hazardous warranty response time is on-site within one hour. Priority situations, emergency and hazardous, include imminent release of hazardous of dangerous materials, situations with imminent danger to life or property, and a complete site-down situation or 50 percent or more of the fuel dispensing capacity for any one product is inoperative. Overtime will be paid for priority situations only occurring outside routine warranty service hours.
- Warranty repair requiring rented equipment, overtime premium, lodging or charter travel must be approved in advance of service expenditure by the Gasboy Warranty Administration Department.

Commercial Pumps and Dispensers, Full -Cabinet Consumer Pumps

Commercial Pumps and Dispensers, Full-Cabinet Consumer Pumps are warranted against defects in material and workmanship for one year from date of installation or 24 months from date of original invoice, whichever occurs first. Warranty coverage includes parts and labor.

Exclusions: This warranty excludes hose breakaways, nozzles, hoses and fittings, nozzle-end swivels, retriever cables, graphics materials specified by the customer, fuel filters, belts adjustments, meter calibration, fluorescent lamps, vapor recovery testing and balance system piping, customer-specified items manufactured by others, and customer requested reprogramming of equipment. Some of these excluded items may be warranted by their manufacturer, and warranty claims in connection with these items should be presented directly to the manufacturer.

Small Transfer Pumps, Meters, Pressure Regulators

Small Transfer Pumps, Meters and Pressure Regulators are warranted against defects in material and workmanship for 24 months from date of installation or 30 months from date of original invoice, whichever occurs first. Non-registered equipment warranty will default to invoice date. The warranty covers parts only. Excepting the Model 2020 Hand Pump, which has a 90-day part warranty from date of original invoice.

New Spare Parts

All new spare parts or warranted replacement parts are warranted against defects in material and workmanship for one year from date of original invoice. The warranty covers parts only.

Keytrol

The Keytrol is warranted against defects in material and workmanship for one year from date of installation or 24 months from date of original invoice, whichever occurs first. Warranty coverage includes parts and labor

Fuel Management Systems

CFN/Profit Point, Series 1000/FleetKey, TopKAT, and factory installed Fuel Point Reader are warranted against defects in material and workmanship for one year from date of installation or 24 months from date of original invoice, whichever occurs first. Warranty coverage includes parts and labor.

Standalone and Retrofit Fuel Point Readers, and Fuel Point-vehicle and dispenser components are warranted against defects in material and workmanship for one year from date of installation or 24 months from date of original invoice, whichever occurs first. The warranty covers parts only.

The warranty for field installed/retrofitted Fuel Point Readers is non-transferable. The removal and installation of such components into another pump/dispenser will void the warranty.

Fuel Management Systems

Peripherals (Modems, CRT's, Flat Screen, Scanner, PIN Pad, Customer Display,) are warranted against defects in material and workmanship for one year from date of installation or 24 months from date of original invoice, whichever occurs first The warranty covers parts and labor.

Printers (Logger, Receipt, etc.) are warranted against defects in material and workmanship for 90 days from date of installation or 180 days from date of original invoice. The warranty coverage is parts and labor.

Peripherals (Encoders and Embossers) are warranted against defects in material and workmanship for six months from date of original invoice. The warranty covers parts only.

General Exclusions

1. Problems caused by faulty installation are not covered by this warranty. This warranty applies only if equipment has been installed and used in accordance with Gasboy Installation, Operating and Service Instructions. Problems caused by improper maintenance of equipment are not covered by this warranty.
2. Use of service personnel other than qualified Gasboy service providers without prior approval of the Warranty Administration Department will void payment of the warranty claim in question.
3. Damage suffered by Gasboy's equipment resulting from shipping, accident, power surges, neglect, misuse, act of Nature, or abuse is not covered by this warranty.
4. Use of non-Gasboy replacement parts, defects caused by the unauthorized addition of non-Gasboy items to Gasboy equipment or by the unauthorized alteration of Gasboy equipment voids this warranty.
5. THIS WARRANTY DOES NOT COVER ANY INDIRECT DAMAGES OR LOSS OF PRODUCT OR REVENUE. Repair or replacement of the defective part or component under the terms of this warranty is the EXCLUSIVE REMEDY. Gasboy is not liable for incidental, consequential or indirect damages or loss, including without limitation personal injury, death, property damage, environmental damages, product damages, loss of product, or loss of revenue or profits. Gasboy is not liable for any claims or lawsuits against the customer.
6. This warranty does not cover any pump or dispenser components in contact with fuels containing more than 5% methanol or 10% ethanol or 15% MTBE by Volume. This warranty does not cover any component(s) exposed to M85/E85 fuel or other alcohol rich fuel.

THE WARRANTY CONTAINED HEREIN IS EXCLUSIVE AND THERE ARE NO OTHER EXPRESSED, IMPLIED OR STATUTORY WARRANTIES. WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

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