# GASBOY 9800 SERIES
# DISPENSER RETROFIT for HEALY SYSTEMS, INC.
# MODEL VP1000
# VAPOR RECOVERY ASSIST SYSTEM
**(KIT Z081)**

## OUTLINE

This Manual is to be used for new, replaced, retrofitted, or reconditioned dispensers/pumps.


1. **Purpose**
2. **Safety**
3. **Models Covered**
4. **Parts Lists**
5. **Tools Required**
6. **Dispenser Access**
7. **Survey Scope of Work**
8. **Installing The Healy VP1000 System**
9. **Installing The Sealed Nipple Assembly**
10. **Connecting Vapor Lines**
11. **Wiring Inside The Electronics Compartment**
12. **Connecting Healy Systems Dispensing Equipment**
13. **VP1000 Theory Of Operation**
14. **Testing The System**
15. **Trouble Shooting The VP1000**
16. **VP1000 Vane & Rotor Service & Replacement Guide**

**Start-up/ New Installation/ Warranty/ Annual Testing Form**

## 1. PURPOSE:

This procedure describes the tools, methods and skill levels required to install a Healy Systems, Inc. Model VP1000 Vapor Recovery pump in non-vapor ready Gasboy™ model 9800 series gasoline dispensers. Only Healy trained and certified contractors will be able to perform these retrofits or warranty will be void. The installer shall be a skilled petroleum technician and thoroughly familiar with the requirements of State, Federal and local codes for installation and repair of gasoline dispensing equipment. Also, they shall be aware of all the necessary safety precautions and site safety requirements to assure a safe and trouble free installation. NOTE: All electrical and hydraulic plumbing fittings referred to in these instructions must be UL "listed" or "recognized" for the purpose.

**Note:** Installations of vapor piping into the inlet side of the vacuum pump should be sloped such that the natural flow direction is toward the vacuum pump. However, it is permissible to have a piping slope tilted away from the vacuum pump provided that all other applicable tests (Dispenser integrity and V/L) meet the specifications outlined in the appropriate section of the Executive Order and ***ARB Approved Installation, Operation and Maintenance Manual***.

**Note:** For installations with In-Station Diagnostics (ISD), the vapor flow meter shall be installed on the down stream side of the vacuum pump. Every effort shall be made to install the vapor flow meter so that vapor piping between the vacuum pump and the vapor flow meter is sloped such that the natural flow direction is toward the vapor flow meter. However, it is permissible to have the piping slope away from the vapor flow meter provided that all other applicable tests (Dispenser integrity, V/L and ISD Operability) meet the specifications outlined in the appropriate section of the Executive Order and ***ARB Approved Installation, Operation and Maintenance Manual***.

## 2. SAFETY:

Before installing the equipment, read, understand and follow:

- The National Electrical Code (NFPA 70)
- The Automotive and Marine Service Code (NFPA 30A)
- Any national, state and local codes that may apply.

The failure to install the equipment in accordance with NFPA 30A and 70 may adversely affect the safe use and operation of the system.

Accurate, sound installations reduce service calls: Use experienced, licensed contractors that practice accurate, safe installation techniques. Careful installation provides a sound troubleshooting framework for field repairs and can eliminate potential problems.

1. Read all instructions before beginning.
2. Follow all safety precautions:
   - Barricade the area.
   - Do not allow vehicles or unauthorized people in the area.
   - Do not smoke or allow open flames in the area.
   - Do not use power tools in the work area.
   - Wear eye protection during installation.
3. Use circuit breakers for multiple disconnects to turn off power and prevent feedback from other dispensers.

## 3. MODELS COVERED:

Gasboy 98XXQX all suffix except I, S, 2, 3, 25, 35 & 9 gasoline dispensers. The addition of the Healy Systems VP1000 to the 98xx's will increase the current draw of the dispenser by 2 amps. Use the label supplied to note this change. This kit will retrofit a two hose unit: if single hose, a sealed cap is provided to close off one side.

NOTICE: BE SURE NOZZLE HOOK AND HOOD IS THE CORRECT ONE FOR A VAPOR RECOVERY NOZZLE AND HAS TO BE SPECIFICALLY ORDERED.

## 4. PARTS LISTS: (See Photo A)

1 VP1000 Vacuum Pump

1 1374A Wire Harness / MC100 Series Interface Module Assembly

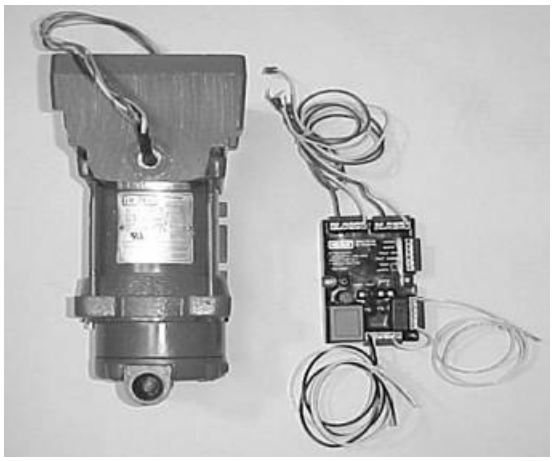
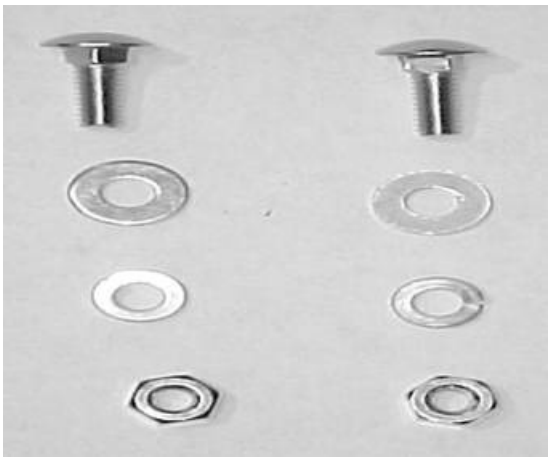


**Photo A**



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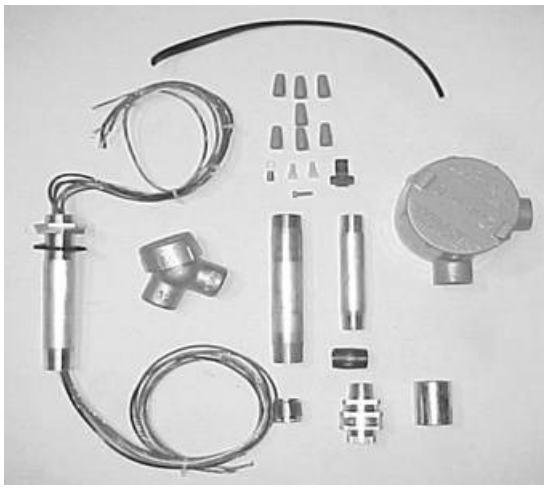


**Photo C**

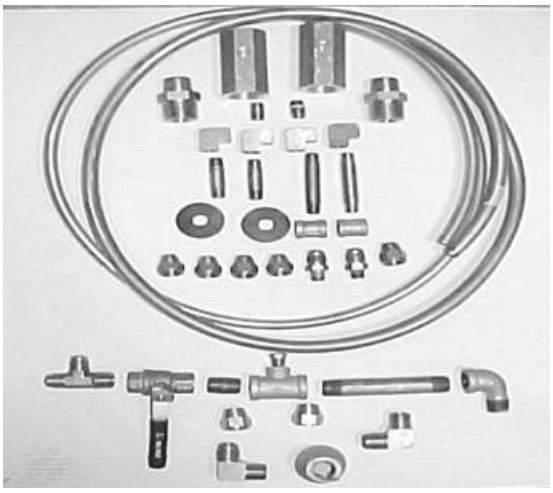


**Photo D**

**HARDWARE KIT Z081H: (See Photo B)**

2 1/4-20 bolts, washers, lock washers and nuts

**ELECTRICAL KIT Z081E: (See Photo C)**

1 Current change label (p/n 1405)

9 Wire nuts

1 8-32 x 5/8" machine screw

| | |
|---|---|
| 1 | 3/4” electrical coupling |
| 1 | #1316 potted conduit nipple |
| 1 | #8 Ring tong terminal |
| 1 | Notice label (p/n 1406) |
| 1 | UL Listed label (p/n 1410) |
| 1 | 1/2” electrical capped elbow |
| 1 | 3/4 ” x 1/2 “ electrical reducing bushing |
| 1 | 1/2” electrical close nipple |
| 1 | 1/2” electrical union |
| 1 | 1/2” x 4-1/2” electrical nipple |
| 1 | 3/4” x 6” electrical nipple |
| 1’ | rubber channel grommet |
| 1 | Explosion proof junction box |
| 1 | Scotch-Loc connector (RED) |

**VAPOR KIT Z081V: (See Photo D) – assumes 2 hose unit**

| | | | |
|---|---|---|---|
| 2 | 1/4” NPT X 1/2” flare straight fittings | 2 | 1/4” NPT couplings |
| 4’ | 1/2” OD copper tube, type ‘L’ | 2 | 1/4” close nipple |
| 2 | 1/4” x 2” nipple | 2 | 1/4” x 3” nipple |
| 1 | 1/2” x 1/4” x 1/2” reducing tee | 1 | 1/2” ball valve |
| 1 | 1/4” pipe plug | 4 | 1/2” flare nuts |
| 1 | 1/2” NPT x 1/2” x 1/2” flare tee | 1 | 1/2” flare cap |
| 1 | 1/2” street elbow galvanized | 4 | 1/4” elbows |
| 1 | 1/2” x 5” galvanized nipple | 1 | 1/2” close nipple |
| 2 | CX6-A Healy hose adaptor (splitter fitting) | 2 | 5/8” flare nuts |
| 2 | 1” NPT x ¾” NPT male/male adaptor | 1 | 1” x 1/2” bell reducer |
| 2 | Hole mask washers (self adhesive) | 3’ | 5/8” OD copper tube, type ‘L’ |
| 2 | 1/2” NPT x 5/8” flare elbow fittings | | |

**MATERIALS SUPPLIED BY INSTALLER:**

- Thread Sealing Compound – non-Setting, UL Classified for use on all tapered thread, non-electrical, plumbing fittings.
- Oil and gasoline compatible PTFE tape
- <u>Non flammable drape (to cover mechanical parts while drilling holes)</u>

## 5. TOOLS REQUIRED:

- 1/2” or 3/8” ratchet set w/ sockets 1/4” through 9/16” + 3” extension
- 9” lineman’s pliers
- Assorted open end wrenches 1/4” through 3/4”
- Wire cutters/strippers 18 AWG and 26 AWG
- 1-1/8” Greenlee type sheet metal punch
- Mechanical hand drill (egg-beater type)
- Assorted drill bits 1/16” through 7/16”
- Assorted screwdrivers (flat blade-one must be 1/8” wide and Phillips)
- 1/2” copper tube bending tool
- 1/2” copper tube flaring tool
- 5/8” copper tube bending tool
- 5/8” copper tube flaring tool
- Copper tubing cutter
- Electrical multi-Oeter
- Small hand brush (1-1/2” thick, for clearing chips)
- 12” adjustable wrench
- 10” pipe wrench
- Tape measure
- Allen wrenches

## 6. DISPENSER ACCESS: (See Photo E)

- Secure Dispenser Access keys from Station Management.
- Lock-out and tag-out all electrical power to dispenser being modified.
- Remove both lower dress panels.
- Remove both upper bezels
- Remove the top sheet metal assembly.
- Remove the 4, 5/16 – 18 nuts and washers holding the top electrical chassis to the vapor barrier. Retain for reinstallation later in procedure.

# WARNING

This retrofit kit requires drilling in a Hazardous Location. Insure that all power to the dispenser has been turned off. Open all access doors for increased airflow. Use only sharp drill bits; dull bits may generate excessive heat. Use air powered drill at low RPM's. If an electric drill is used, a suitable UL Listed Gas Detector must be used to ensure the area is below 25% of the Lower Explosive Limit. Do not drill if gasoline odors are present.

If drilling in the electronics cabinet, carefully collect and remove all metal shavings that may be inside the cabinet. Failure to remove the shavings could result in an electrical shock hazard. Before drilling, check to ensure that no wires or fluid containing parts (i.e. product tubing) is located on the backside or near the chuck of the drill.

**7. SURVEY – Scope of Work:** ***Perform this step before beginning steps 8 thru 12.***

Read and familiarize yourself with the theory of operations sheet and wiring instructions for the VP1000 Vapor Pump. The installation of the pump is on the sheet metal shelf under the meters on the side opposite the electrical 'J' box in the free space on the right hand side, see photos F & G. From this survey, you will have an indication of where the vapor plumbing fittings need to go and where the holes need to be drilled in the adjoining sheet metal to allow the vapor pipes from the pump to pass through the side skins to the hydraulics compartment. The Healy potted conduit nipple is installed under the upper electronics chassis in a 1 1/8" hole that needs to be drilled through the sheet metal panels. See Photo H and Section 9.

**CAUTION: ALL POWER TO DISPENSER UNDER MODIFICATION SHOULD BE COMPLETELY DISCONNECTED AND CAPPED OFF AT JUNCTION BOX TO AVOID UNINTENTIONAL FEEDBACK FROM OTHER DISPENSERS!!**

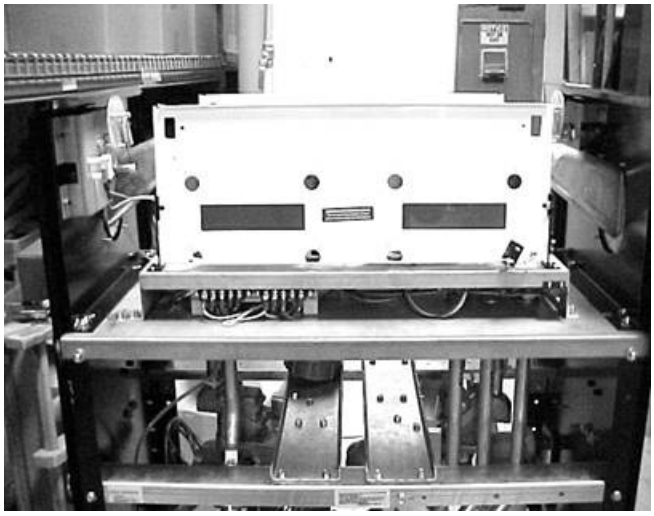


**Photo E**

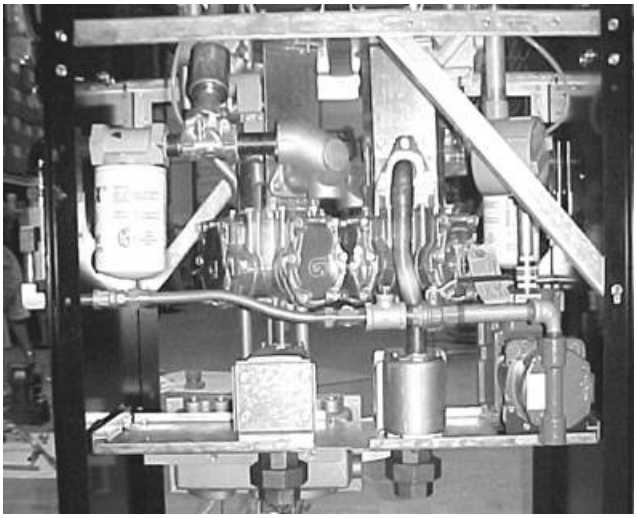


**Photo F**

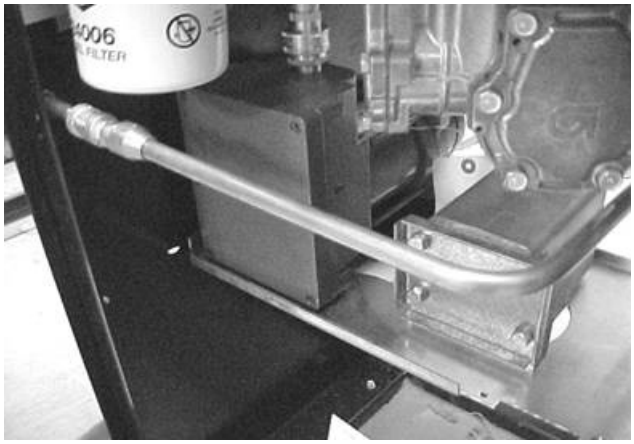


**Photo G**

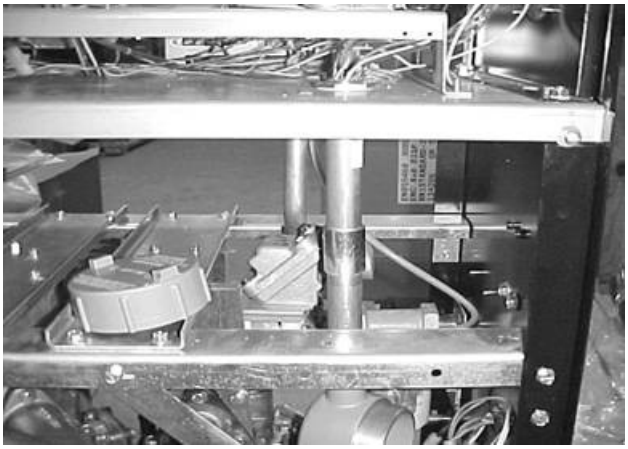


**Photo H**

## 8. INSTALLING THE HEALY VP1000 SYSTEM:

**NOTICE:** WHEN DRILLING HOLES, ASSURE THAT THERE ARE NO HAZARDOUS VAPORS PRESENT AND DO NOT ALLOW CHIPS TO FALL DOWN INTO THE HYDRAULICS AREA.

- In order to make the vapor connection from the CX6-A hose adaptor installed outside the cabinet to the VP1000 pump installed inside the cabinet, it is necessary to drill or punch a 7/8” hole see photo I. Measure 1-1/4” to the left of the right edge of the side panel, make a small line. Measure 20-5/8” up from the bottom edge of the side panel (NOT THE BASE OF THE DISPENSER), make a small line forming a cross and drill or punch the 7/8” hole. Repeat on other side if a dual hose unit.
- In order to make the electrical connections from the VP1000 pump which will be installed in the meter area to the upper electronics compartment where the interface module is mounted a 1-1/8” hole has to be made.
- Before beginning this step, place a nonflammable, flexible drape over the meter and encoder gears to prevent chips from the following drilling operation from falling into the gear mechanisms.
- Carefully lift the previously loosened electronics chassis from the mounting bolts and position toward the electrical ‘J’ box side of the cabinet about 5” from the edge of the shelf and set down.
- In line with the sealed nipple going to the meter encoder and 4-1/2” in from the edge of the chassis drill or punch a 1-1/8” hole to mount the 3/4” sealed nipple assembly, see photo J.

**Photo I**

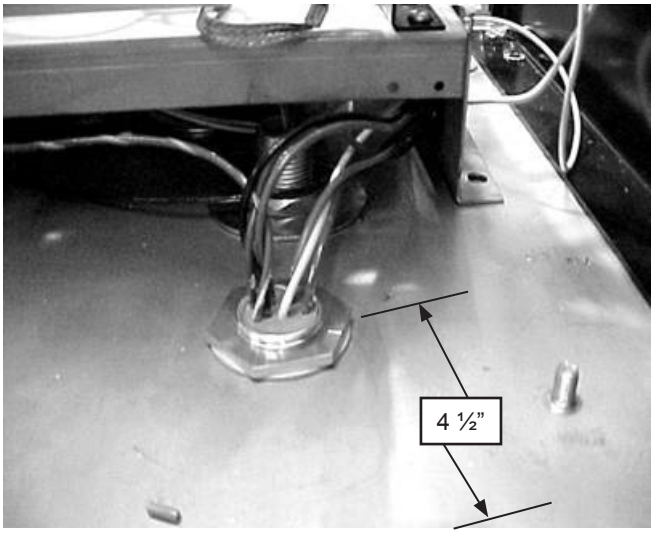



**Photo J**

- Position the VP1000 pump on top of the sheet metal shelf on the right end, on the side opposite the main electrical ‘J’ box, see photo F & G.

## 9. INSTALLING THE SEALED NIPPLE ASSEMBLY:

- Reposition the chassis to better expose the rectangular cutout in the side of the chassis. Surround this hole with rubber gasket material supplied, see photo K.
- Install the sealed nipple by carefully removing the first nut and washer, then slide the wires up, through the 1 1/8” hole and reinstall the washer and nut. Be sure at least one full thread is showing over the nut but not more than two threads and tighten the nuts securely, see photo J.
- Gather the upper wires and put through the grommeted opening in the chassis, from under the chassis and reposition the chassis on it’s mounting studs. Check to be sure no wires are trapped under the edges of the chassis – do not re-install the mounting hardware at this time, see photo K.
- Below the top shelf, slide a 3/4” electrical coupling over the wires from the nipple, followed by the 3/4” x 6” electrical nipple. Secure these connections, see photo L.
- Remove the cover on the electrical junction box supplied and feed the nipple wires into the box until the box and nipple contact, then slowly rotate the box at least five turns before positioning the remaining conduit hub to the rear, towards the pump motor.

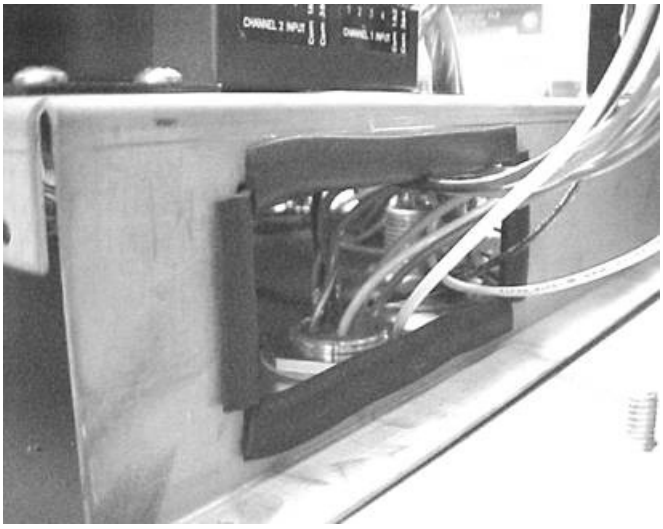


**Photo K**

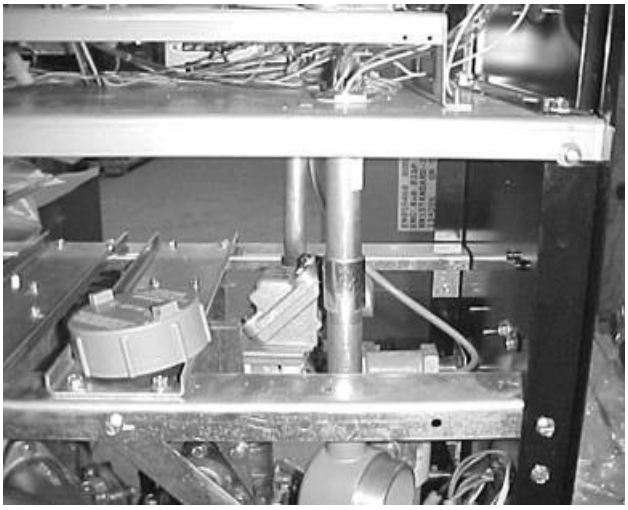


**Photo L**

- Remove the cover from the capped elbow and install a 1/2” close nipple into one of the conduit hub openings. To this nipple, add a 1/2” x 3/4” electrical reducing bushing. Install this completed assembly into the open conduit hub on the junction box installed above, see photo M.
- Install the female half of the electrical union on to the 1/2” x 4-1/2” electrical nipple, then install the nipple into the open conduit hub on the capped elbow.
- Thread the motor wires through the male half of the electrical union and install the part into the motor, see photo O.
- Carefully thread the motor wires up through the 4-1/2” nipple, into the capped elbow. Pull the wires tightly as the two halves of the union are aligned and screw down the securing collar. Be sure no wires are pinched between the two halves of the union.
- Push the motor wires through the capped elbow into the junction box and replace the cover on the capped elbow.
- Leave about 6” of wire on each piece in each bundle of wires, then strip all wires 3/8” and join, color for color using wire nuts supplied. Replace the cover, see photo N.

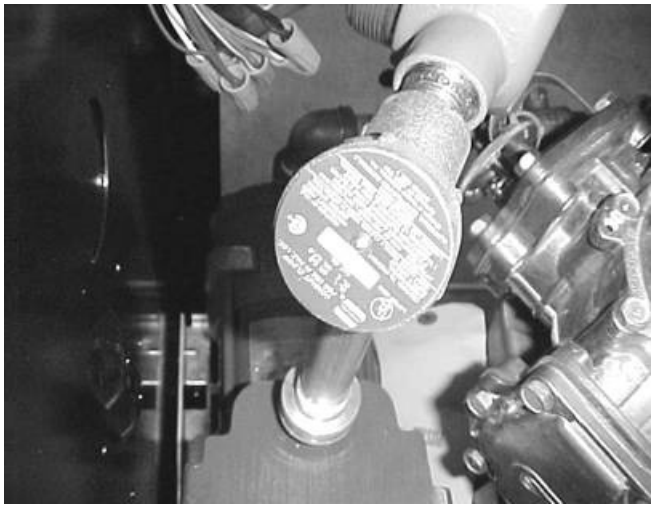


**Photo M**

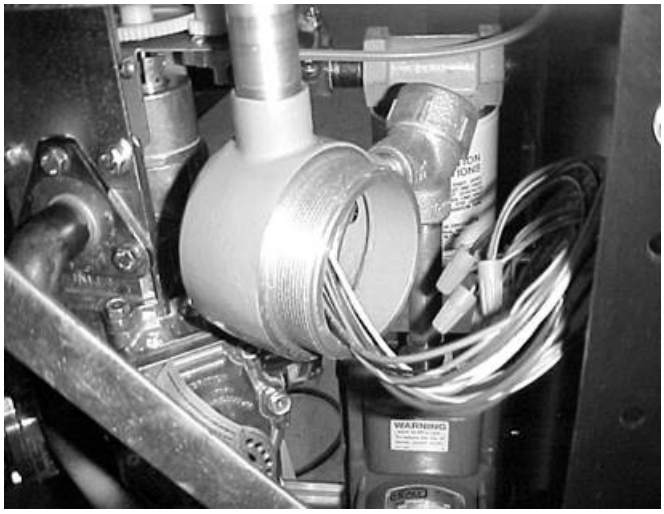


**Photo N**

**Photo O**

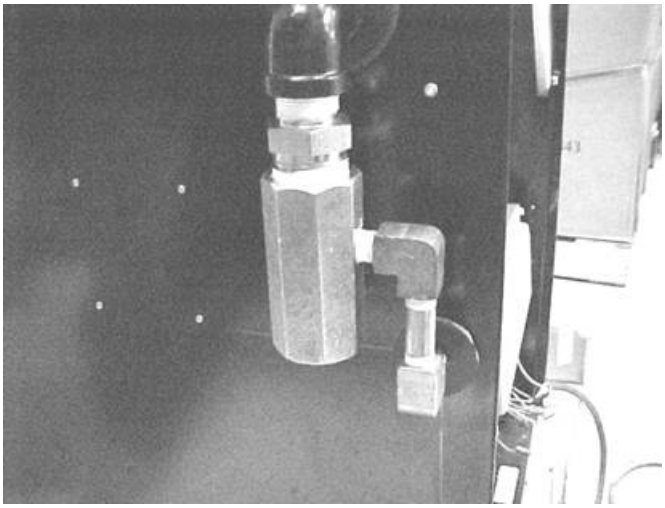


**Photo P**

**10. CONNECTING VAPOR LINES: (See Photos F, G, P, Q & R)**

- Apply pipe sealant to the threads on the 1” x 3/4” male threaded nipple and install the 3/4” end into the product outlet on the dispenser. Note: Gasboy has an alternate 1” discharge fitting. If so equipped, installer will need to supply their own 1” x 2” nipple to install the Healy CX6-A splitter fitting. Do both sides if dual hose.
- Install the CX6-A splitter adaptor to the 1” threaded portion of the nipple and tighten both securely, with the final turn positioning the 1/4” vapor outlet of the CX6-A facing the closest edge of the cabinet. Do both sides if dual hose, see photo P.
- Note: Use Oil and gasoline compatible PTFE tape on the following steps.
- Assemble a 1/4” close nipple and elbow to the vapor hole in the CX6-A adaptor. Position the elbow to face downward. Do both sides if dual hose.
- Assemble the 1/4” x 2” nipple into elbow and then attach another elbow, positioned to face the cabinet wall when tightened. Do both sides if dual hose.
- Install the 1/4” x 3” nipple from inside the cabinet slide the nipple through the cabinet, toward the elbow but slide on the hole mask washer (white paper towards cabinet) between the outside of the cabinet and the elbow fitting. Do both sides if dual hose, see photos P & Q.
- Install the 1/4” coupling to the 1/4” x 3” nipple and then install a 1/4” NPT x 1/2” flare straight fitting in the coupling – tighten securely. Do both sides if dual hose, see photo Q.
- Remove the white protective tape from the hole mask washer installed above and press adhesive surface against cabinet. Do Both sides if dual hose.

**Photo Q**

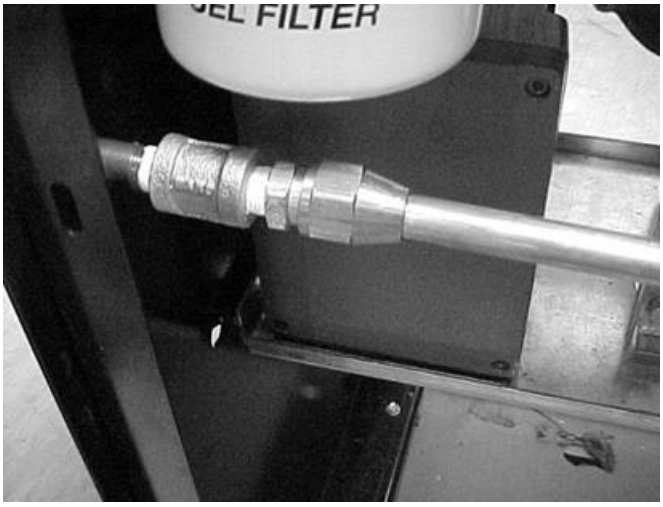
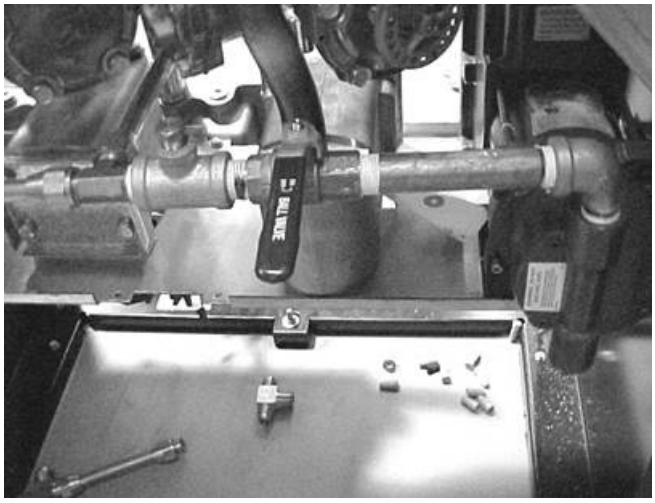



**Photo R**



- Note: Use Oil and gasoline compatible PTFE tape on the following steps.
- Install the 1/2” street elbow to the inlet of the pump, tighten to face left, see photo R.
- Install the 1/2” NPT x 5” nipple to the elbow above. Install and tighten the 1/2” ball valve such that when the handle is closed, it points toward the outside of the cabinet.
- To the ball valve, install a 1/2” close nipple and the 1/2” x 1/4” x 1/2” reducing tee. Completely tighten with the 1/4” opening facing up.
- To the tee, install the 1/4” NPT plug and the 1/2” NPT x 1/2” x 1/2 ” flare tee. NOTE: If upgrade is being done on a single sided dispenser, install the 1/2” flare cap provided, onto the remaining tee opening.
- Make up a piece of 1/2” OD copper tube that will go from the flare tee on the ball valve to the straight flare fitting on the coupling leading to the CX6-A fitting outside the cabinet, see photo F.
- Refer to photo G for the next piece of 1/2” OD tube that is run from the CX6-X fitting on the other side of the dispenser. Carefully bend the piece to fit between the two meters and line up with the remaining port on the tee on the motor inlet plumbing.
- The vacuum pump is now well contained by both the electrical and vapor plumbing. If further fastening is required, drill two 5/16” holes up from below the center panel and through the mounting plate on the VP1000. Secure the pump with the nuts and bolts supplied.

## 11. WIRING THE ELECTRONICS

- Remove the screws from the two indicator/display panels and allow to lay flat.
- The interface module assembly will be mounted on top of the electronics chassis in the space at the right rear corner looking from the non ‘J’ box side of the dispenser. Before mounting, however, the red “DANGER” must be relocated about 5” to the left. Also, it is easier to make the wire connections with the module lifted up rather than secured to the chassis, see photo S.

- Loosely position the module on the electronic chassis, see photo S, dress the wires coming from the sealed nipple assembly over to the module leave at least six inches longer than necessary to reach the terminal boards on the module. Cut off excess and strip all wires 1/2".

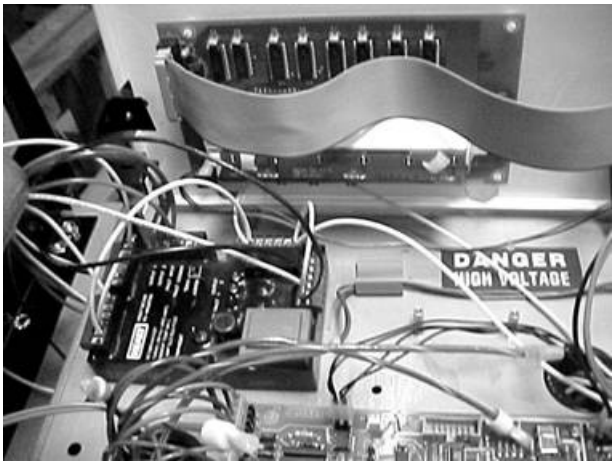



**Photo S**

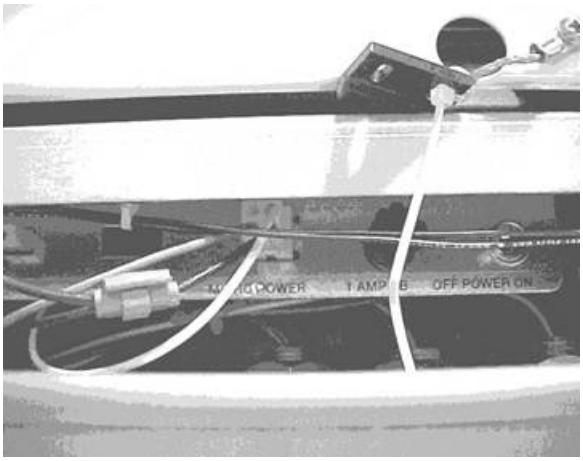


**Photo T**

- **Connect the wires from the sealed nipple to the interface module as follows: NOTE: Make sure the module screws contact the wire not the insulation.**
  - **Black wire to 'motor ' on module**
  - **White wire to 'neutral' on module**
  - **Red wire (either) to 'output 1' on module**
  - **Red wire (other) to 'output 2' on module**
  - **Orange wire to 'fault common' on module**
  - **Purple wire to 'fault input' on module**
  - **Green wire needs a #8 ring tong lug (provided) installed and connected to any chassis ground (frame)**
  - **Some sealed nipples may have extra wires, cap these and bundle them neatly out of the way.**
- The single black wire on the module is routed down through the center black grommet hole and to the far side of the upper deck. Locate the black/green/white wire set from the factory installed sealed nipple that go to the switch bracket assembly and are marked "MICRO POWER". Select the black wire in the connector and Scotch-loc™ the black wire from the module to the black wire in the connector, see photo T.
- The input signal wire connections are made to the valves terminal board under the electronics chassis. Route the yellow and red twisted pair (2 sets) of wires from the module through the rectangular hole containing the motor wires under the chassis to the valves terminal strip. Attach one set (yellow and red twisted pair) to one valve, and the other set to the other valve. The yellow and red wires supplied, with the terminals attached are screwed, one on each, on top of the existing yellow wires and red wires on each of the valve terminal boards. Be sure to keep the red and yellow pairs together on the same valve.

- To obtain the electrical neutral connection for the module and motor requires interrupting the white (neutral) wire going to the three wire (5-position) connector on the Micro board. The module is supplied prewired with two white wires, one going to neutral on the power input strip on the module and the other going to pin location 1 on the disconnect relay. There is also a small white jumper going from pin 6 of the disconnect relay to a neutral on the power input strip.
- Get the white wire going to the power input strip and strip 3/8” off the end. Locate the white wire going to the MICRO connector and cut the wire, leaving about 1-1/2” going to the MICRO connector and the wire going back through the hole under the chassis. From the wire going under the chassis, strip 3/8” and connect to the previously stripped white wire going to power neutral. Use a wire nut supplied to secure and insulate the connection.
- Get the white wire going to pin 1 on the disconnect relay and strip 3/8” off the end. At the MICRO board, strip 3/8” off the other white wire in the connector and join with the first white wire. Secure with a wire nut supplied.

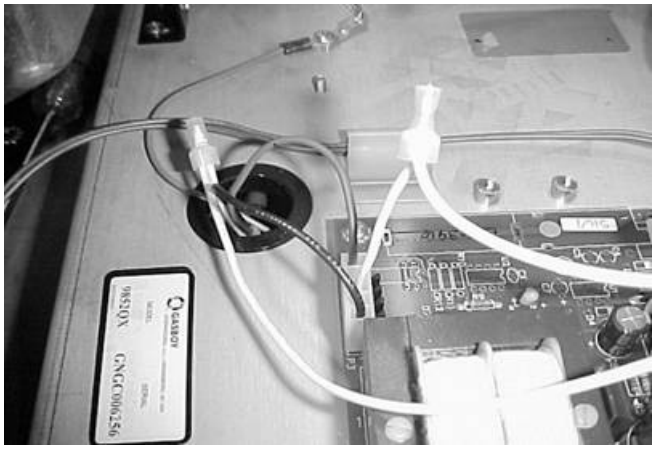


**Photo U**

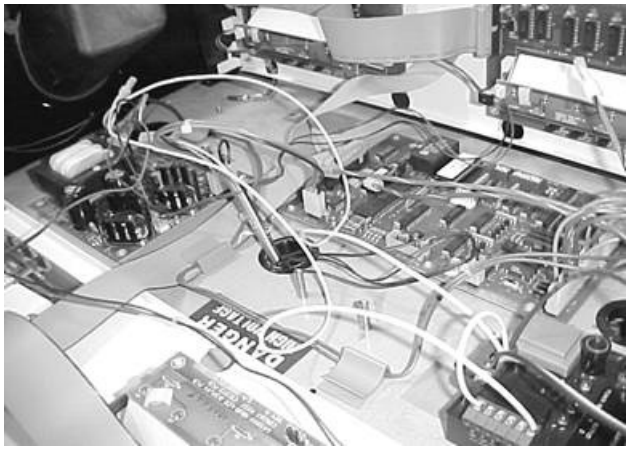


**Photo V**

- Mount the interface module as shown in photo S using the 8-32 x 5/8” screw, supplied in the electrical kit. There is an existing hole in the chassis that is the right size and in the right place for the thread cutting screw.
- Install the following labels supplied:
  - NOTICE label for current increase, install on the inside of the cabinet panel near the existing power consumption label, see photo W.
  - Large NOTICE label relating to the vapor recovery upgrade and how to reset the electronic module should be installed near the module, where it will be readily visible to a service technician on the inside of the cabinet near the nozzle spout housing, see photo X.
  - UL, retrofit kit identification number, install near the electronic module.

Photo W

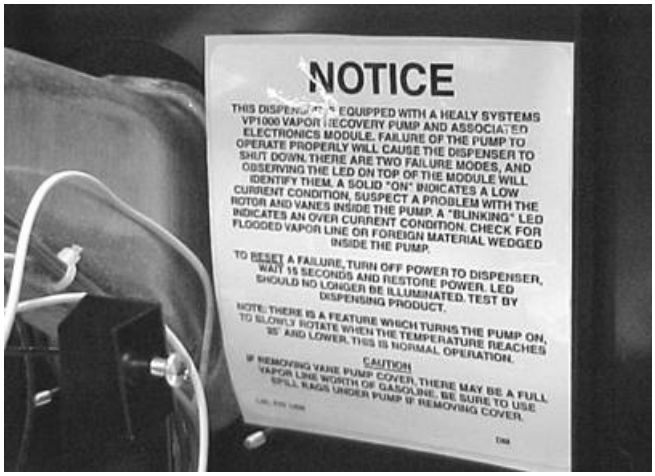



Photo X

- **Replace the screws holding the indicator/display panel in place, the nuts and washers holding the electronics chassis to the vapor barrier and replace the top cover.**
- **Replace the two bezels and lower cabinet doors.**

## 12. CONNECTING HEALY SYSTEMS DISPENSING EQUIPMENT

- **Completing the connection of Healy Systems dispensing equipment requires the installation of Healy Systems Phase II dispenser adaptors, hoses and nozzles (Hanging Hardware).**
- **If applicable, remove existing non-Healy hanging hardware (from the dispenser product outlet adaptor to and including the nozzles).**
- **Healy Vapor Recovery Hoses are available in various lengths to satisfy local ordinances and still provide “far side” fueling capability. Install these following instructions contained on the shipping box.**
- **Breakaways are required: Install either Model 8701-VV breakaway or Model 807 swivel breakaway; install using the instructions supplied with the unit.**
- **The Healy Systems nozzle Model 900 (EVR) is the only nozzle necessary to complete the upgrade. Check to be sure the nozzle hanger is mounted in the highest position. Be sure to check for proper fit in the nozzle holster and that the nozzle can be locked in the off position. Also, be sure that when the nozzle is locked, that the dispenser cannot be activated from the locked position.**

## 13. VP1000 THEORY OF OPERATION

The Healy Systems VP1000 is a self-contained rotary vane pump, designed for gasoline vapor recovery utilizing various parts of the Healy System Vapor Recovery product line. It is intended for use by either OEM dispenser/pump manufacturers or as an after market add-on to make existing equipment compatible with Healy System technology. In order to convert to 'others' equipment, an electronic interface is required to adapt the targeted pump/dispenser to the new vapor recovery equipment. The interface senses when authorization to dispense has been given and sends signals to the motor to operate at a low speed for one hose, or a higher speed for two hoses. It also functions to shut off the pump/dispenser if it senses that the vapor pump is not operating properly. The vacuum is regulated at a level sufficient to clear liquid gasoline from the vapor path in MPD applications. The actual amount of vapors withdrawn is controlled by the Healy nozzle, itself, in response to the liquid gasoline flow rate.

### MOTOR SPECIFICATIONS

| | |
|---|---|
| Horsepower | 1/8 |
| Voltage | 120VAC |

### INTERFACE SPECIFICATIONS

| | |
|---|---|
| Input voltage | 120 VAC |
| Relay current capacity | 5A AC |
| Input signals | AC and DC voltages up to 130 VAC max |
| Motor Input signal | 5 VDC @ 20 Hz 50% Duty Cycle |

## 14. TESTING THE SYSTEM:

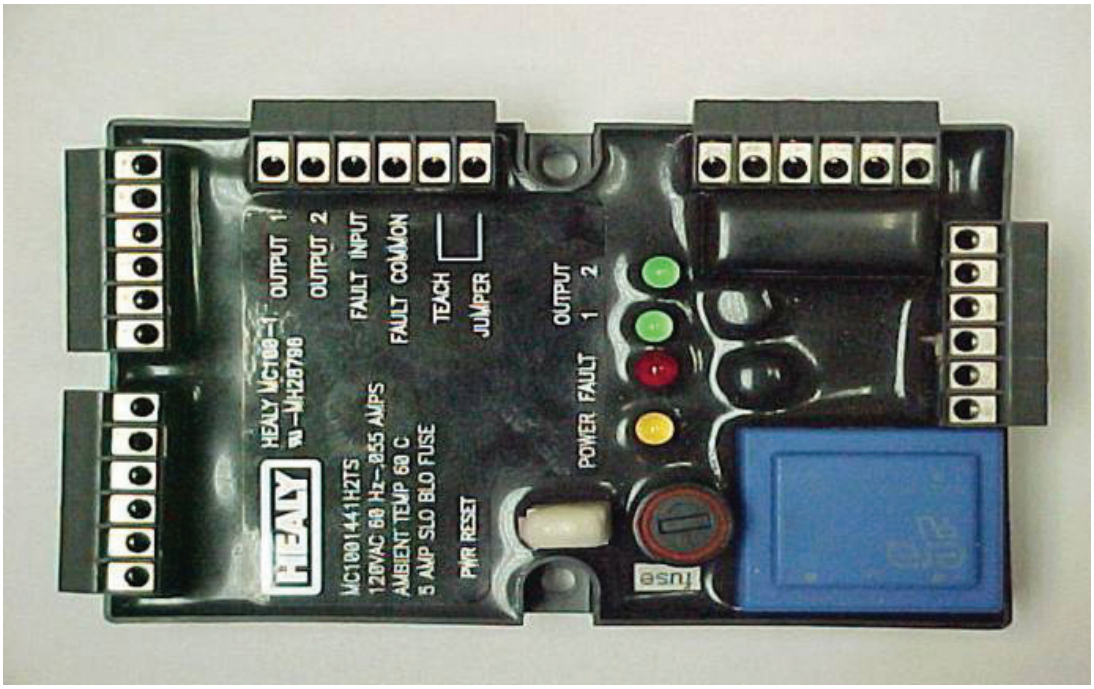
- Carefully review all work completed, being sure all mechanical joints are thoroughly tightened and electrical connections sealed.
- Open the product crash valves and restore power to the dispenser.
- With the power on, but no nozzles authorized, the VP1000 should not be running (unless the ambient temperature is below 40°F), but the power LED (yellow) should be energized on the interface module.
- Authorize one handle and the vacuum system should activate when the gasoline flow control valve is engaged. Repeat for all other nozzles, individually testing each nozzle on each side of dispenser. With each authorization, one of the green LED's on the interface module should illuminate and the VP1000 activate.
- **Note:** For unihose dispensers, conduct individual tests for each product grade on each side of the dispener to ensure that the same LED activates for all grades on the same side. If the other LED activates, wiring needs to be corrected.
- Authorize one nozzle and listen to the speed of the VP1000. With only one nozzle activated, the speed will be slower than if a nozzle on <u>each side</u> is activated. Activate a nozzle on the other side of the dispenser and listen for the speed to change.
- To test the tightness of the vapor plumbing installed on the suction side of the system requires a 0-100" water column gauge. Connect the gauge into the 1/4" test port of the reducing tee installed earlier in section 10 Photo R. Continue by following and completing the START-UP / NEW INSTALLATION/ WARRANTY/ ANNUAL TESTING FORM.

## 15. TROUBLESHOOTING THE VP1000:

- Use extreme care and caution when performing the tests listed below. If 120 VAC is accidentally applied to the fault or DC terminals, the module will be destroyed.
- With power applied to the dispenser, but no products authorized, there should be 120 VAC between neutral and 120 VAC on the module terminal strip.
- As above, with any product authorized, there should be single speed power applied to the VP1000. Verify this by checking for 2-3 VDC from OUTPUT 1 (RED WIRE) to FAULT COMMON (ORANGE WIRE), (or from OUTPUT 2 TO FAULT COMMON) also; one GREEN LED should be illuminated. With a second product authorized on the opposite side of the dispenser i.e. one product on each side, the motor should operate at higher speed and there should be 2-3 VDC on both output 1 and 2 (to fault common) and both GREEN LED's should be illuminated.
- With the pump running, a fault can be simulated by shorting, with a jumper wire, the "FAULT INPUT" (purple wire) to FAULT COMMON (orange). This should cause the motor to shut off, the solenoid valves to lose power and the dispenser to shut down. Also, as long as the short is maintained, the red LED will be illuminated. Removing the short will not automatically reset the module. To reset the module, remove the short, remove power to the dispenser for twenty seconds and restore power. The module should now be reset and the red led extinguished. This can also be accomplished by using the power reset (PWR RESET) on the module.

- If diagnosing a problem where the LED is already illuminated, a steady light indicates a low current condition, therefore expect a vane or rotor problem. If the LED is blinking, that indicates a high current condition and would expect to find a jammed rotor or vapor line flooded with product. . See Start-up/ New Installation/ Warranty/ Annual Testing Form.
- The electronics of the motor will make three attempts to have a successful start of the motor. If it detects a problem, on the fourth unsuccessful start, it will short the fault line to signal minus (DC-) and shut down the electronics.

**MC100 Interface Module**



## 17. VP1000 VANE & ROTOR SERVICE & REPLACEMENT GUIDE

**Caution** **Disconnect power before beginning service.**

1. The work area **must** be clean and have sufficient lighting.
2. Disconnect the vapor piping connected to the **IN** and **OUT** ports of the VP1000 cover assembly.
3. Remove the four Allen head screws and lock washers that secure the pump cover assembly to the pump housing and remove the cover carefully.

**Caution** **Use a spill cloth when removing the cover, as there may be some gasoline inside the pump cavity**.

4. Carefully turn the rotor assembly by hand until the shaft key notch is at the 12 o'clock position. (See Figures)
5. Remove the rotor, vanes and shaft key from the pump housing.

**Note:** Place your hand or a container under the rotor while removing. Do not use any sharp objects that would scratch the surfaces of the pump cavity, pump shaft, rotor, or vanes.

6. Rotate the shaft by hand. If the shaft does not rotate freely, the entire vacuum pump needs replacement (p/n VP1000-5 or RVP1000-5).
7. If the rotor and vanes are cracked, chipped, excessively worn or excessively dirty, the rotor and vanes should be replaced because cleaning will not remedy these conditions (p/n VP1000VRC-G, VP1000VRC-P or VP1000VRC).
8. If there is no visible damage, use a lint-free cloth with isopropyl alcohol to clean the rotor and vanes.
9. Using a lint-free cloth with isopropyl alcohol, thoroughly clean: the inside of the pump ring and rear of the pump cavity, the rotor shaft, and the inside of the pump cover.
10. Reposition the shaft (if necessary) so that the shaft key notch is in the 12 o'clock position. Install the cleaned original or new shaft key onto the shaft.
11. Carefully install the cleaned original or new rotor onto the shaft followed by the cleaned original or new vanes into the rotor.

**Note:** The rotor assembly should slide on to the shaft easily, without excessive force. (Rotors and vanes are reversible)

12. Lightly lubricate and install the new O-Ring for the pump housing.

**Note:** Do not allow any lubricant to get inside the pump housing.

13. Install the pump cover using the four Allen head screws and lock washers removed in step 3 and cross tighten.

**Note:** Use caution when sliding the pump cover over the O-Ring seal to prevent cutting or tearing.

14. Re-connect the vapor piping to the **IN** and **OUT** ports of the pump cover assembly that was removed in Step 2.
15. Re-apply power. Test for normal operation. (See VP1000 Vacuum Performance Test Procedure)

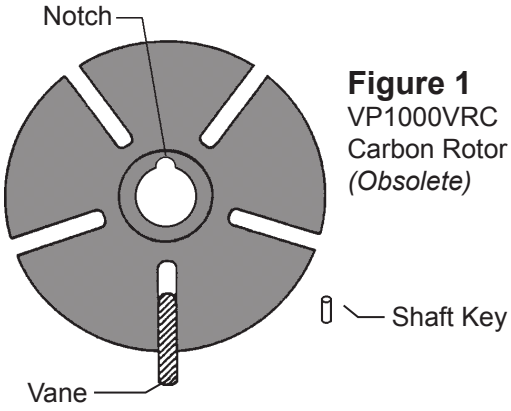



**Figure 1**
VP1000VRC
Carbon Rotor
*(Obsolete)*

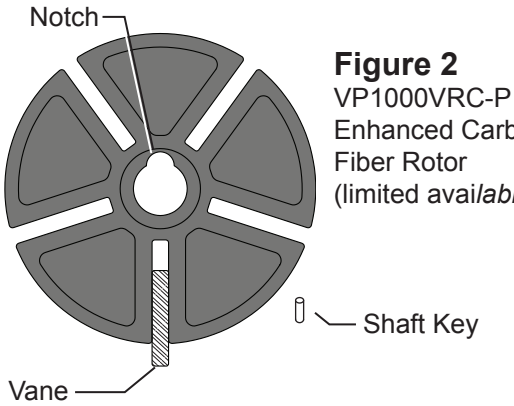



**Figure 2**
VP1000VRC-P
Enhanced Carbon
Fiber Rotor
(limited avai*lability)*

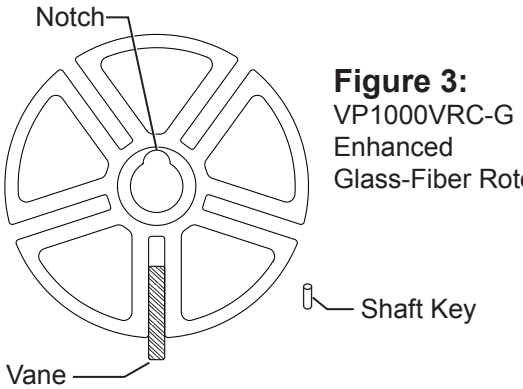



**Figure 3:**
VP1000VRC-G
Enhanced
Glass-Fiber Rotor

START-UP/NEW INSTALLATION/ WARRANTY/ ANNUAL TESTING FORM (Rev. 10/07)
HEALY VP1000 VACUUM PUMP

Date_____

**BOTH SIDES OF THIS TEST FORM MUST BE COMPLETED FOR NEW INSTALLATIONS**

- **Start-up / New installations – complete SIDE A and sections 3, 4, 5 and 6 of SIDE B. Submit forms to Healy Systems.**
- **Warranty Service or Annual Testing – complete contact information, dispenser make, vacuum pump serial # and the tests in sections 1 and 2 on SIDE A and conduct the appropriate tests specified on SIDE B. Submit Forms to Healy Systems.**

| | | |
|---|---|---|
| SERVICE COMPANY NAME | TELEPHONE | |
| SERVICE TECHNICIAN | HEALY TECH CERT # | |
| STATION ADDRESS | CITY | STATE |
| **DISPENSER MAKE** | **VACUUM PUMP SERIAL #** | |

# SIDE A

| **DISPENSER EQUIPMENT CHECKLIST - Parts A-1 and A-2** | | **YES** | **NO*** |
|---|---|---|---|
| **A-1** | Is all the installed dispenser hanging hardware listed in Exhibit 1 of Executive Order VR-201 or VR-202? | | |
| **A-2** | Proper installation of the VP1000 requires the test port and ball valve on the inlet side of the vacuum pump. Are the test port and ball valve installed correctly? | | |
| | ***If the answer to either A-1 or A-2 is NO, the Healy Warranty is Void.** | | |

## A-3

- THE FOLLOWING TEST WILL PERFORM A POSITIVE PRESSURE LEAK CHECK OF THE VACUUM PUMP, DISPENSER VAPOR PIPING, HANGING HARDWARE AND ALL NOZZLES ON BOTH SIDES OF THE DISPENSER.
- THE VP1000 OUTLET IS NOT CONNECTED TO UNDERGROUND PIPING DURING THIS TEST.

**CAUTION: REGULATE GASEOUS NITROGEN TO 2.5 PSI (~70" WC) MAXIMUM BEFORE TESTING**

1. Install a 0-100 inch water column (" wc) mechanical gauge at the VP1000 test port.
2. Use the water column gage positive (high) pressure port.
3. Gaseous nitrogen gas can now be connected to the outlet (exhaust) port of the VP1000.
4. Test pressure **cannot** exceed 70" wc.
5. **Slowly** introduce the gaseous nitrogen to a pressure between 60 – 70" wc.
6. After reaching the pressure range, close the valve supplying the gaseous nitrogen.
7. Record the initial pressure reading on the gauge - observe and record the final pressure reading after 60 seconds.
8. Leaks must be repaired when the pressure falls more than 4" wc in 60 seconds.
9. Retest until all leaks have been repaired.
10. Record test results in Section A-4.

| **A-4**<br>**PRESSURE TEST**<br>**2.5 PSI (~70"wc) Maximum** | **Initial Pressure test reading ("wc)** | **Pressure test reading after 60 seconds ("wc)** |
|---|---|---|

START-UP/NEW INSTALLATION/ WARRANTY/ ANNUAL TESTING FORM (Rev. 10/07)
HEALY VP1000 VACUUM PUMP

Date_____

**BOTH SIDES OF THIS TEST FORM MUST BE COMPLETED FOR NEW INSTALLATIONS**

- **Start-up / New installations – complete SIDE A and sections 3, 4, 5 and 6 of SIDE B. Submit forms to Healy Systems.**
- **Warranty Service or Annual Testing – complete contact information, dispenser make, vacuum pump serial # and the tests in sections 1 and 2 on SIDE A and conduct the appropriate tests specified on SIDE B. Submit Forms to Healy Systems.**

# SIDE B

| *Warranty Service*<br>Complete Troubleshooting Sections<br>**B-1 and B-2** | *Start-up/ New Installations/ Annual Testing*<br>Complete Sections<br>**B-3 through B-6** |
|---|---|

## B-1

**Control Module Fault Light**

**(Circle one) Flashing (LED) Steady (LED)**

1. All fault conditions require removal and cleaning or replacement of the rotor and vanes located inside the vacuum pumps round front cover assembly. Use the **VP1000 ROTOR & VANE SERVICE AND REPLACEMENT GUIDE** in the applicable dispenser retrofit manual of the ARB Approved Installation, Operation and Maintenance Manual for Executive Orders VR-201-O and VR-202-O.
2. Clean all surfaces including vanes, rotor, rotor housing and cover assembly.
3. Manually spin and inspect the motor shaft for bearing wear before re-installing the rotor kit.
4. Replace motor when bearings or shaft are damaged or worn.
5. Check O-ring seal before replacing rotor cover assembly.

## B-2

Re-Assemble / Reset Vacuum Pump and Module. (Power must be removed from both the vacuum pump and the **module for 20 seconds to reset the system**) using the power reset switch on the MC100 module.

## B-3

Dispenser Vapor Line Integrity Test

1. Install 0-100 inch water column (“ wc) vacuum mechanical gauge at the VP1000 test port.
2. Authorize the dispenser for fueling. The VP1000 will begin to run.
3. Close the ball valve at the pump inlet.
4. Record the initial vacuum reading on the gauge – observe and record the final vacuum reading after 60 seconds.
5. Open the ball valve at the pump inlet.
6. Leaks must be repaired when the vacuum reading falls more than 4” wc in 60 seconds.
7. Retest until all leaks have been repaired.
8. Record data in Section B-4.

**Note: If the initial vacuum reading is less than 60” wc, it could indicate a problem with the VP1000. Remove the dispenser from service. Use the troubleshooting section of the manual to investigate problem or contact the FFS Technical Help Desk at 800-984-6266 for assistance.**

## B-4

| VACUUM TEST Using VP1000 as vacuum source | Initial Vacuum test reading (“ wc) | Vacuum test reading after 60 sec. (“ wc) |
|---|---|---|
| | | |

## B-5

Dispenser Vaacuum Test

With one side of the dispenser authorized (VP1000 running) and the ball valve at the pump inlet open, dispense in handheld position a minimum of 0.5 gallons of fuel into a vehicle or test tank. Record the vacuum level while dispensing. Repeat test for the other side of the dispenser.

1. Side “A” Dispensing Vacuum _____” wc
2. Side “B” Dispensing Vacuum _____” wc

**Note: If the dispensing vacuum is less than 60” wc, remove the dispenser from service. See the troubleshooting section of the manual or contact FFS Technical Help Desk at 800-984-6266 for assistance.**

## B-6

Audible Increase Test

Test the VP1000 Vacuum Pump for normal operation. Use the 6 step procedure titled, “Testing the VP1000 Vacuum Pump for normal operation using the following test procedure:” in Section 1.1 (Weekly Inspection and Testing) of the Healy Systems Scheduled Maintenance document in the ARB Approved Installation, Operation and Maintenance Manual for the Healy Phase II EVR System not Including ISD. This is to verify that the pump recognizes when both sides of the dispenser are activated for fueling.

Does the VP1000 Vacuum Pump change speeds (audible increase) when both sides are activated for fueling?

Yes No

If the answer is no, **use the troubleshooting section of the manual to investigate problem or contact the FFS Technical Help Desk at 800-984-6266 for assistance.**

| Repairs - Comments | To Obtain Returned Materials Authorization number (RMA#) Call 800-984-6266<br>Forms can be faxed to Franklin Fueling Systems Customer Service at 800-225-9787 |
|---|---|