

## Installation and Operations Manual 290 60 2420FS with Float Switch Operation

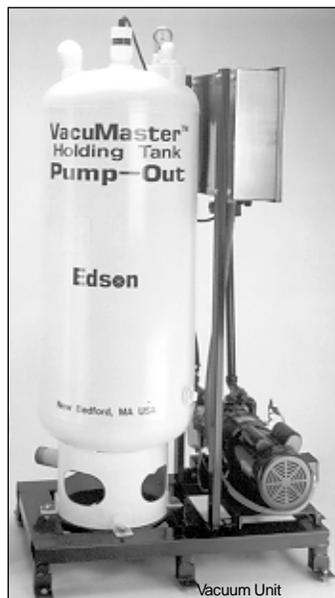
### Index

Page 1 The Pump Out System	Page 6 Electrical
Page 2 Components & Dimensions	Page 10 Hose Assembly
Page 3 Installation	Page 11 Start Up & Operation
Page 4 Plumbing	Page 14 Parts List
Page 5 Vacuum Exhaust	Page 18 Maintenance

### The Pump Out System

290 60 2420FS - Specifies that this Edson vacuum unit was built with a 60 gallon, galvanized steel transfer tank and Model 03, rotary vane, vacuum pump driven by a 3 hp, electric motor set up to operate on 230 volt single phase service. This vacuum system will develop 24" hg of vacuum (27 ft of suction lift) and 20 psi (46 ft of discharge head) and automatically cycle from suction to discharge when the tank is full. The system is complete with hose stand and pump out hose assembly.

Optional Pump Out Components - May include but are not limited to a Hose Stand 260-284, a Pump Out Hose Assembly 261-25-150 and a Bronze Hydrant 270BR-150.



### ENTER YOUR SYSTEM DATA HERE

**SYSTEM SERIAL #**   
From Edson Serial # Sticker On Pump Frame

**VACUUM PUMP**

**Motor**   
From Plates On Motor and Reducer. i.e. 3hp/1ph/230V/TEFC

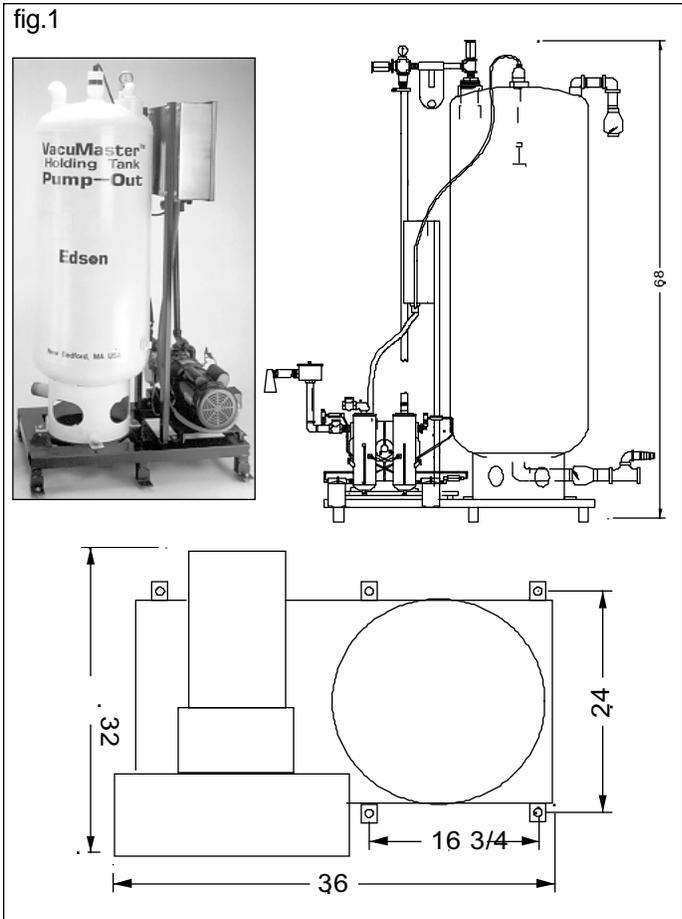
## Component Description & Dimensions

P-290-60-2420FS-99 pg. 2

### Vacuum Unit: fig.1

- Float Switch
- Vacuum/Pressure Gauge Oil Filled
- Two Pressure Relief Regulators
- Stainless Steel Control Panel
- 60 Gallon Galvanized Tank
- 2" Clear Inlet & Discharge Check Valves  
(Two (2) Shipped With System. Not Installed.)
- 20 CFM Vacuum Pump
- 3hp 230 Volt 1Phase 60hz TEFC Motor
- Vacuum Exhaust Odor Control Plumbing
- Dual Continuous Duty Oiler & Oil Recyclers

fig.1



### Optional Hose Stand: fig.2

- White Powder Coated Aluminum
- Start/Stop Buttons
- Operation Instructions and
- (4) 1/2" X 7" Aluminum Hex Head Bolts

### Optional Hose Assembly: fig.3

- 25' X 1 1/2" Hose
- 90° Ball Valve
- Sight Glass/Check Valve
- Quick Clamp Adapter
- Complete Set of Deck Adapters

### Optional Hydrant: (Optional) fig.4

- Bronze Check Valve
- Bronze Ball Valve
- Bronze Quick Clamp Hose Adapter
- Bronze Elbow
- (2) Close Nipple
- Bronze Mounting Flange

fig.2

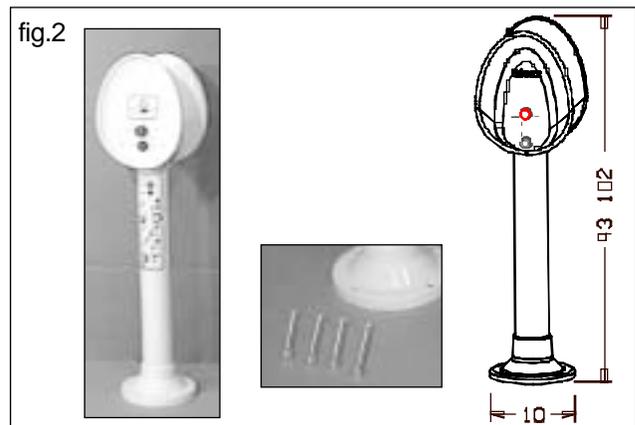


fig.3

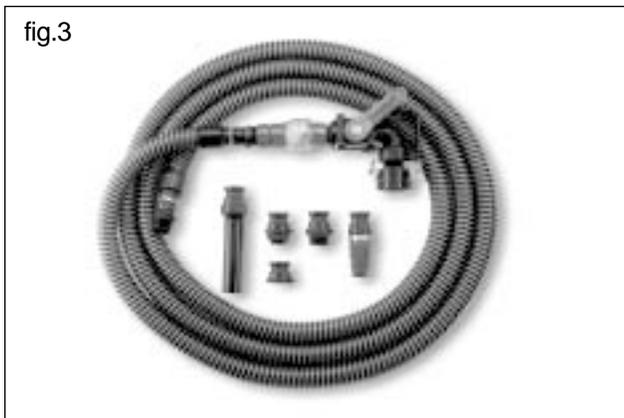


fig.4



**Edson**  
INTERNATIONAL

146 DUCHAINE BLVD., NEW BEDFORD, MA. 02745-1292 TEL. 508-995-9711 FAX 508-995-5021 E-MAIL pumps@edsonintl.com

**IMPORTANT**  
**Fill Oil Recycle With 10W30 Non Detergent Oil Before Starting Vacuum.**  
**Failure to Do So Will Cause Damage to The Model 03 Vacuum Pump.**  
**See Page 11 for Details**

**A Good Plumbing Is Essential To a Good Pump Out.**  
**Review The Entire Plumbing Section Pages 3 to 6 Before Installation**

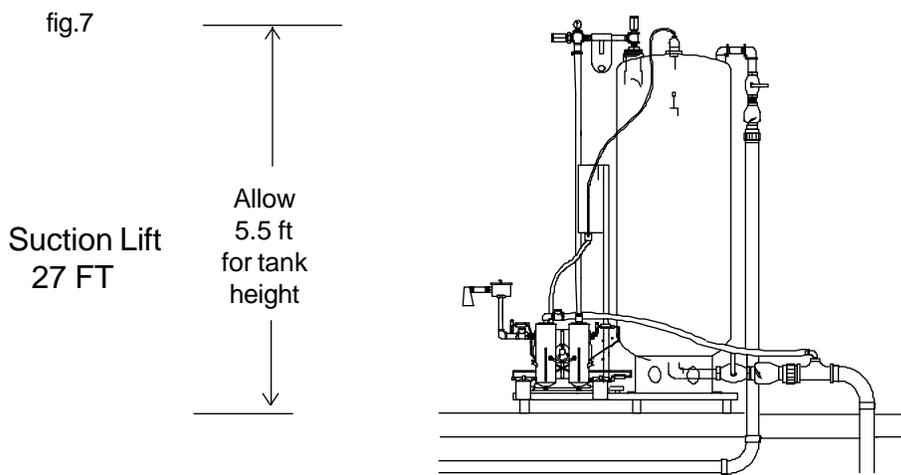
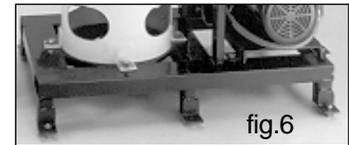
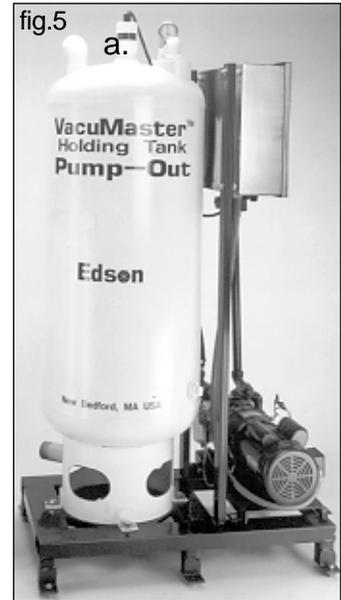
**Inspect & Locate Components:**

**1. Inspect the Vacuum Unit**

- Check All Bolts - Make sure that all bolts on the vacuum unit are secure.
- Plumbing Fittings - All fittings, including those supplied with the pump, must be installed with thread sealant.

**2. Locate the Vacuum Unit**

- Install the vacuum unit on a smooth & level surface to prevent unnecessary vibration and frame distortion.
- Vacuum unit should be installed in a building or under a cover.
- Allow room above the tank to access and remove the float switch. fig. 5a
- Install for Maintenance - Install the unit in a manner that allows easy access for inspection & maintenance. Connect plumbing to the pump using unions or easily removed couplings.
- Install the unit in accordance with the performance specification. fig.7
- Bolt Vacuum Unit Frame To Surface - Unit frame has 6 bolt down flanges use these to secure the unit to the surface with lag bolts or similar fasteners. fig.6



**3. Inspect the Hose Stand**

- Check the hose stand and 4 mounting bolts. Make sure stop/start switches are installed and are secure. fig.8

**4. Assemble The Hydrant per fig 9. Also see page 10**

- Use thread sealant on all components to insure all fittings are air tight.

**Important**

Plan for the electrical cable to be installed to the switches through the bottom of the hose stand.  
Plan for the suction line connection at the bottom of the the 1 1/2" hydrant.

**5. Arrange the Stand and Hydrant at Pump Out Location:**

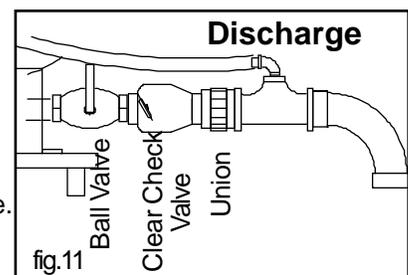
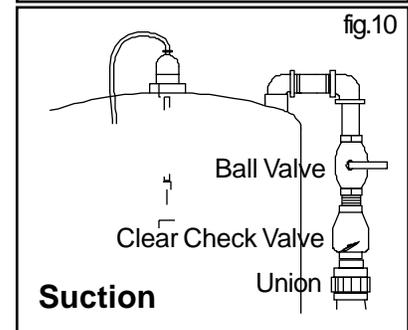
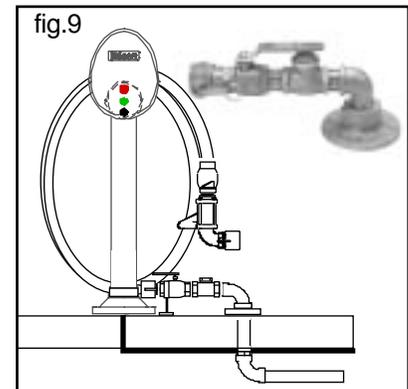
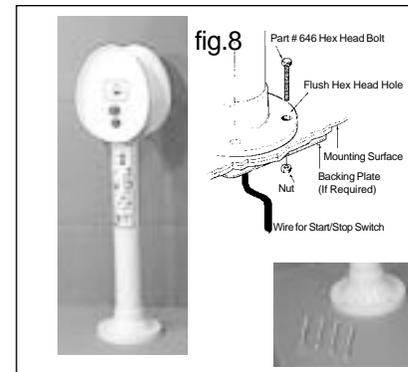
- Position the hose stand and the hydrant so the hose can be easily wound and unwound from the stand. fig 9
- Position the hose stand and hydrant so that the hose can easily reach the boats to be pumped.
- Support hydrant with a plumbing hanger if necessary.
- Use the aluminum mounting bolts to secure the hose stand to the surface. If the 7" mounting bolts supplied can not be used, use appropriate substitutes. Aluminum is recommended.
- Secure hydrant to surface with appropriate hardware.

**Install the Plumbing:****1. Install in Accordance with Local Codes & Standard Plumbing Practices.****2. All Elbows Must Be Long Radius Sewer Sweep Type.****3. Avoid Air Traps ( up and down loops) if possible.****4. Suction Line - Install 1 1/2" ID Hose and/or Pipe between the hydrant and the top of the vacuum tank.**

- Insure all plumbing connections are air tight to vacuum.
- Install a union before the Inlet clear check valve.
- Install a ball valve between the Inlet clear check valve and the tank.
- Install clean outs and drain ports at low points and critical bends in the suction line.

**5. Install 2"ID On the Discharge.**

- Prevent vapor locks. Install plumbing so air travels up and out and is not trapped in pipes or fittings..
- Make all connections air tight to pressure.
- Use only long radius sewer sweep fittings for all elbows.
- Install a ball valve between the tank and the discharge clear check valve.
- Install a union and ball valve after the clear check valve.

**Important Read Page 5**

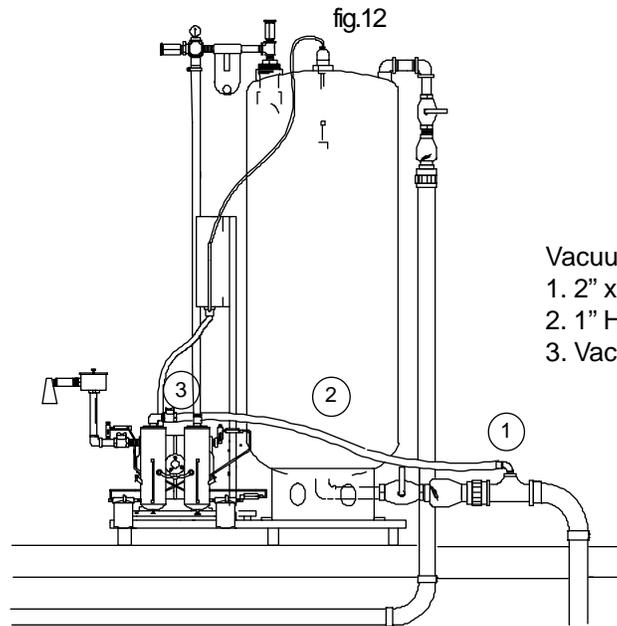
The vacuum system pump is equipped at the factory with fittings that will direct the vacuum exhaust air from the pump into the discharge line. When pumping sewage with vacuum unpleasant odors are generated and proper installation of the vacuum exhaust plumbing will control them.

The exhaust kit shipped with the vacuum unit includes:

- Two bronze 1" one way spring check valves. Installed at factory
- One 2" X 1" Tee with 1" hose barb. Not installed. Shipped with system.
- Five feet of 1" wire reinforced non-collapsing hose. Not installed. Shipped with system.

## 6. Install Vacuum Pump Exhaust Line.

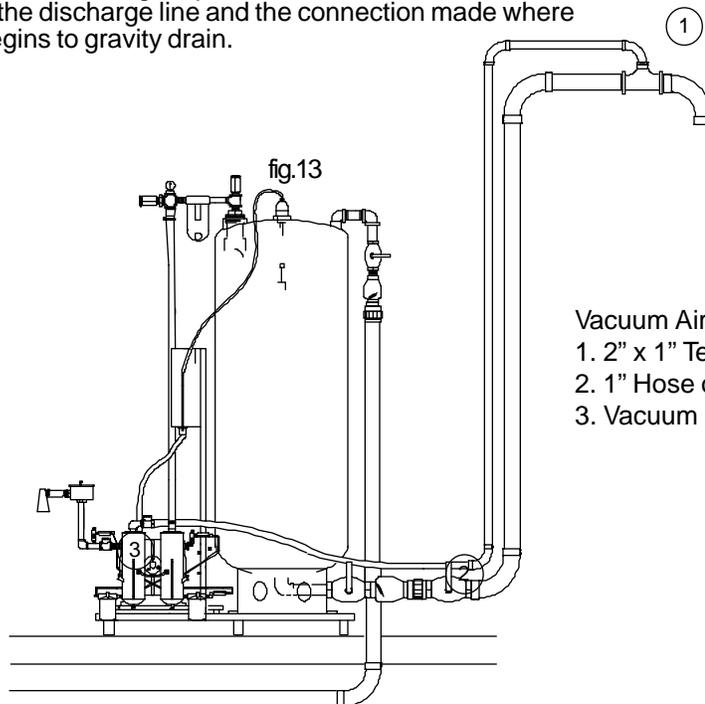
- Negative Head Installations - When the vacuum tank outlet is above the place into where the tank is being emptied, the exhaust air line can be connected right at the tank outlet.



### Vacuum Air Exhaust Plumbing

1. 2" x 1" Tee with Hose Barb Fitting
2. 1" Hose or Pipe
3. Vacuum Exhaust Check Valve

- Positive Head Installations - When the vacuum tank outlet is below the place into where the tank is being emptied, the exhaust air line must be extended parallel to the discharge line and the connection made where the discharge line begins to gravity drain.



### Vacuum Air Exhaust Plumbing

1. 2" x 1" Tee with Hose Barb Fitting
2. 1" Hose or Pipe
3. Vacuum Exhaust Check Valve

**Caution**  
All Electrical Connections Must Be Installed By a  
Licensed Electrician In Accordance With Local Codes

230 Volt Single Phase Power  
Follow Instructions Of Wiring Diagram Pages 7,8&9  
Copy Also Enclosed Inside Control Box

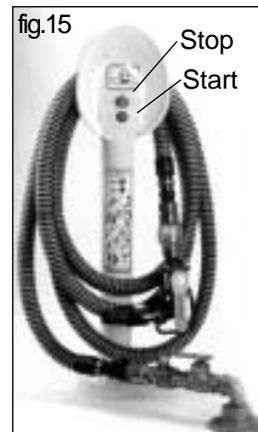
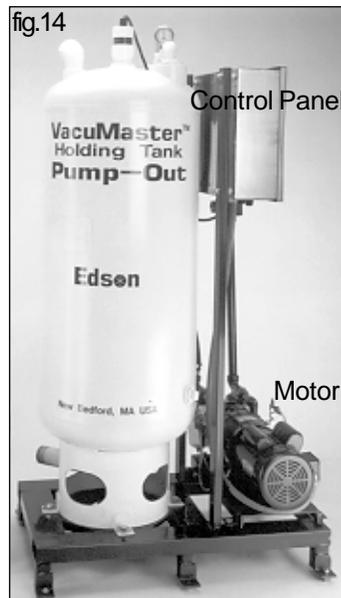
**1. Wire The Vacuum Unit, fig 14:**

- The vacuum unit requires 220 Volt, 1 phase electric power
- Follow the wiring diagram on pages 7,8 & 9

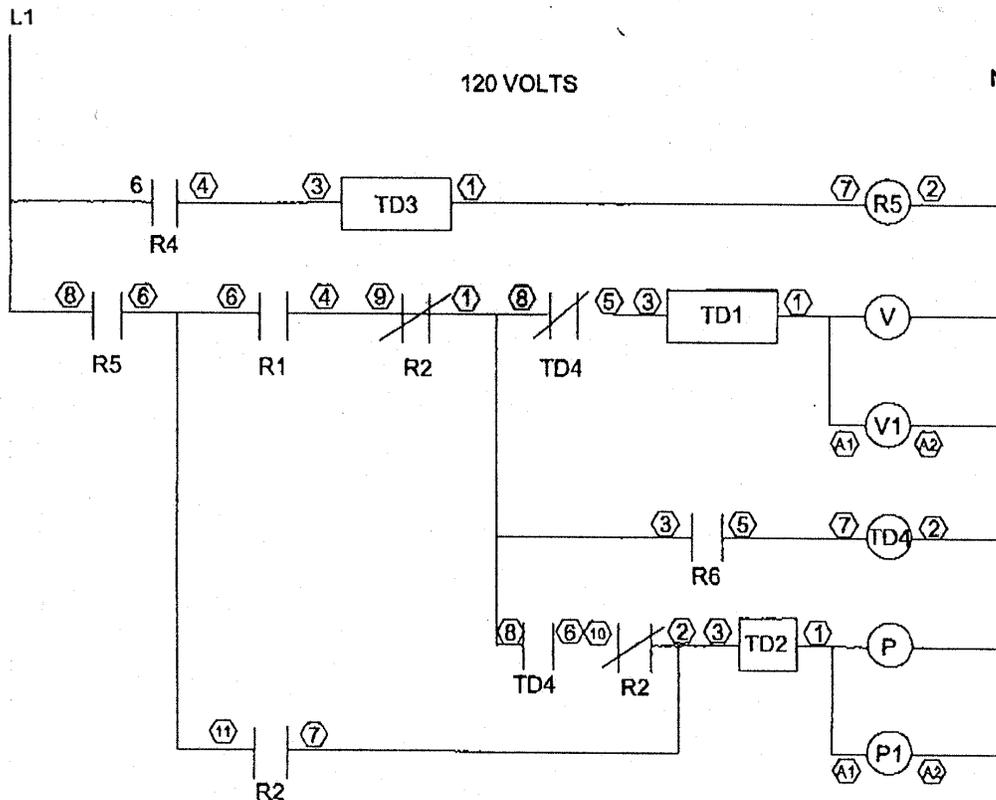
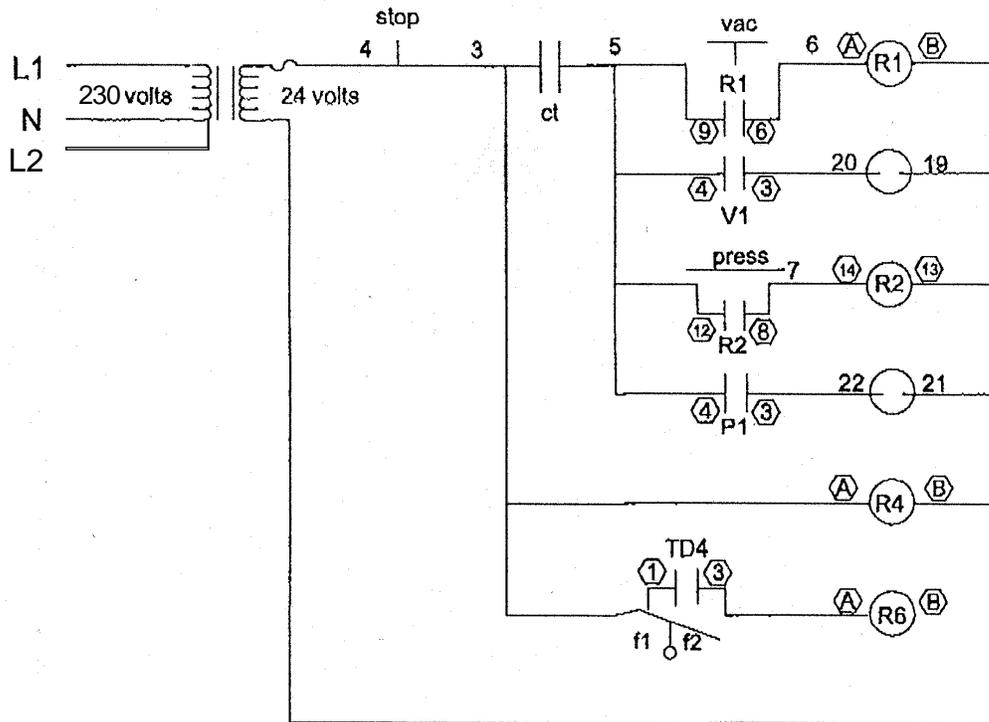
**Important**  
3 hp Motors Operating On 230 Volt Are Rated At  
Full Load AMPS of 15

**2. Wire The Hose Stand Stop/Start Switches to The Control Panel, fig 14 & 15:**

- The start stop switches provided in the hose stands operate on 24 volt power.
- Follow the wiring diagram on pages 7,8 & 9

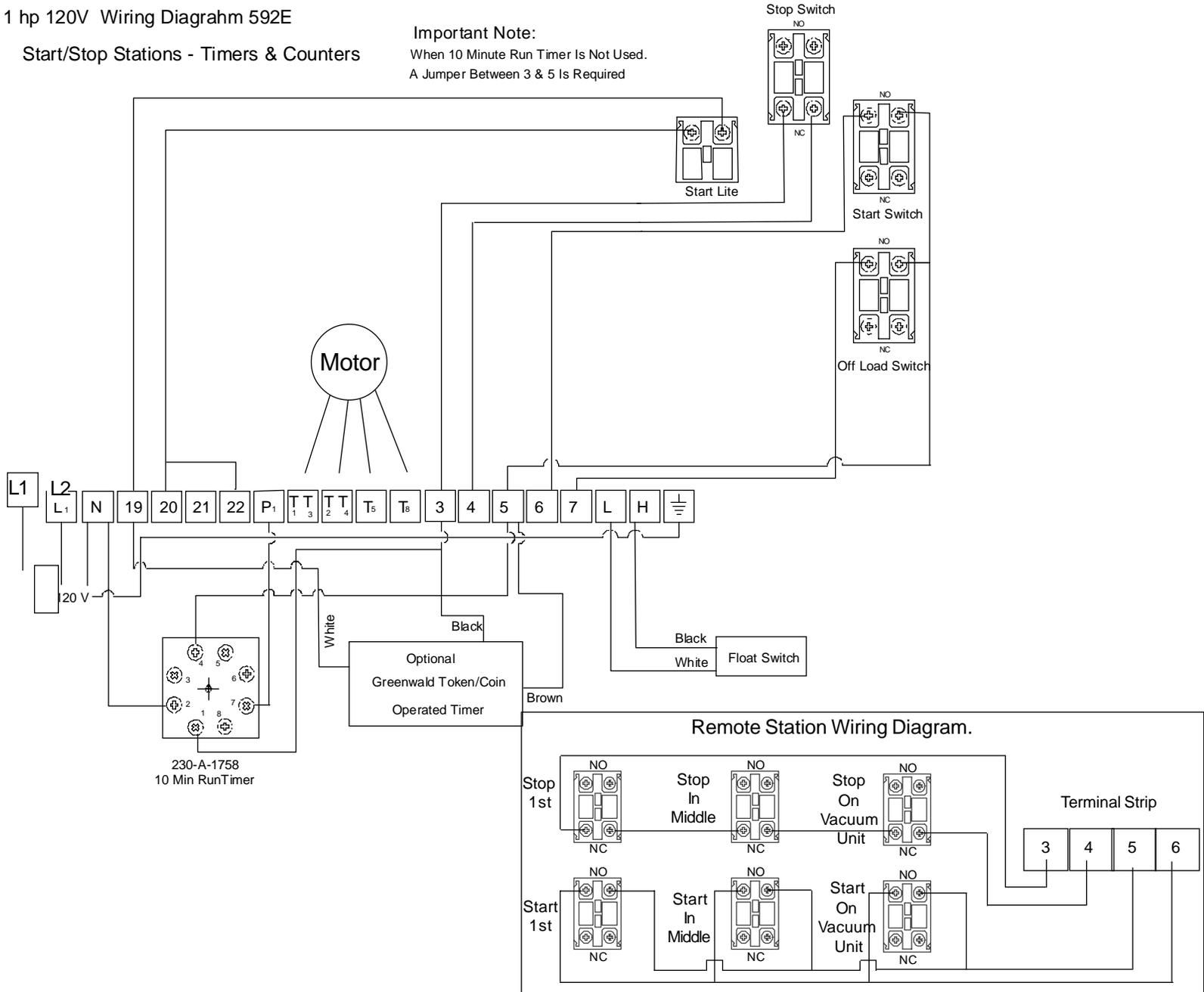


# 592E CONTROL CIRCUIT

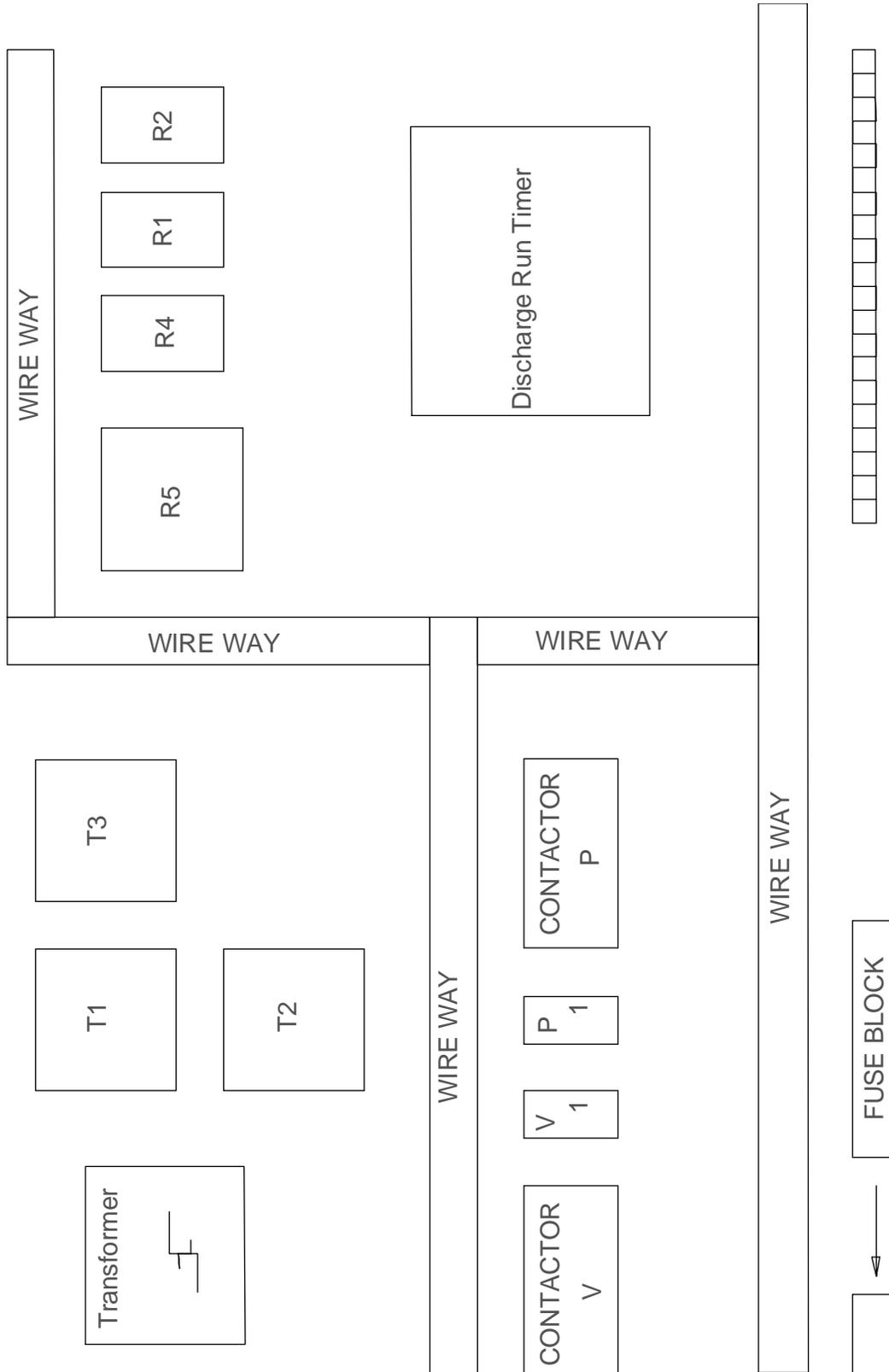


Start/Stop Stations - Timers & Counters

**Important Note:**  
When 10 Minute Run Timer Is Not Used.  
A Jumper Between 3 & 5 Is Required



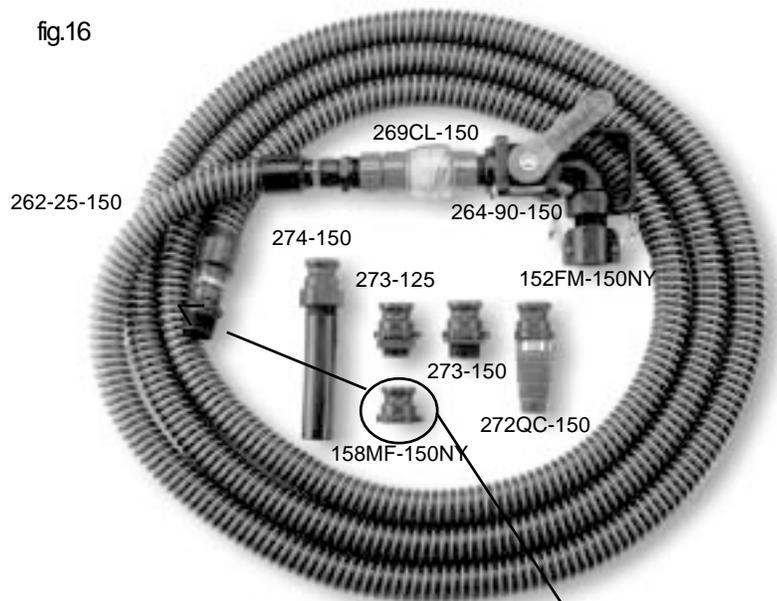
Control Panel Locator



## Install the Pump Out Hose Assembly

### 1. Assemble and Install the Pump Out Hose

- **Use Pipe Sealant On All Threads When Assembling Hose Components.**
- Part 158MF-150NY is an optional fitting used to adapt the thread on the hose end to quick clamp.
- 274-150 is a nozzle extension for use when pumping out portable toilets
- 273-150 & 125 are waste deck fitting adapters. They are screwed into a boat waste deck fitting so the hose can be clamped in place.
- 272QC-150 is a nozzle for use when either of the waste deck fitting adapter do not fit into the boat fitting. It is clamped onto the suction end of the hose and then held into the boat waste deck fitting.



### 2.Parts List

152FM-150NY Quick Clamp Adapter 1 1/2" QC Fe X Ma Npt  
 158MF-150NY Quick Clamp Adapter 1 1/2" QC Ma X Fe Npt  
 262-25-150 Hose Assembly  
 264-90-150 90° Ball Valve  
 269CL-150 Check Valve  
 272QC-150 Pump Out Nozzle  
 273-125 Deck Adapter 1 1/4"  
 273-150 Deck Adapter 1 1/2"  
 274-150 Potty Wand

Fill Oil Recycler: (System Must Be Off & Depressurized.)

## WARNING

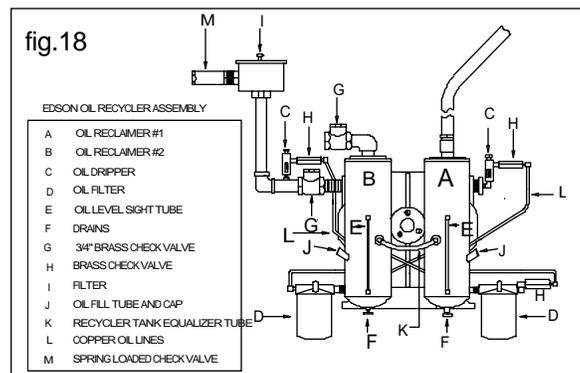
Pressure Gauge Must Read 0 (Zero)

Do Not Try To Fill, Open Or Remove Any Component of the Oiler While The System Is On. Oil Recycler Is Under Pressure When The Vacuum System Is On. Injury Could Occur As A Result.

## IMPORTANT

Fill Oil Recycle With 10W30 Non Detergent Oil Before Starting Vacuum. Failure to Do So Will Cause Damage to The Model 03 Vacuum Pump.

1. Fill both oil reclaimers A & B fig 19 with non-detergent 10W-30 or 40 motor oil.
2. Fill through the 2 Oil Fill Tubes (J).
3. Add oil until the level is above the level equalizer tube to E on the sight tube
4. The pump is being lubricated when it is in the vacuum mode (suction) , and also when it is in the pressure mode (discharge) .



### Oil Drippers:

Drippers (C) fig. 19 have been preset at the factory to allow approximately one drip of oil to enter the system every five (5) seconds. Check the drip rate and reset, if necessary. See Maintenance page 18 -Oil Recycler - Setting Oil Drippers.

### Pump Unit Start Up & Operation:

## IMPORTANT

All Testing Should Be Carried Out Using Available Clean Water. Do Not Pump Waste Liquids Until You Are Sure Unit Is Operating Properly

1. Press Green Start Switch:

## IMPORTANT

### 35 Second Start Time Delay

There is a 35 second delay from the time the start switch is pushed till motor starts . This delay is built into the start cycle to protect the motor from overload.

- 35 second. delay for unit to start in vacuum mode. ( Protects Motor from Over Amping.)
- Vacuum pump will continue to run in vacuum mode until stop button is pushed or until float switch goes horizontal with full tank.
- Check to insure a small amount of oil from the reservoir is drawn into the pump lubricating it.
- With the tank check valves in place and the ball valves open vacuum should be felt on the inlet side of the tank but the tank gauge will read zero.
- Close the inlet ball valve and watch the pressure/vacuum gage. The gauge should record vacuum (Hg) pressure. Open the inlet ball valve and the gauge should drop back to zero.
- Press the red stop button to stop the motor and turn off the unit.

## 2. Press Yellow Pressure Switch:

- Motor starts and drives the air pump in the pressure mode.
- The motor & air pump are running in the pressure mode pressurizing the tank.
- Check to insure a small amount of oil from the reservoir is drawn into the pump lubricating it.
- With the tank check valves in place and the ball valves open pressure should be felt on the discharge side of the tank but the tank gauge will read zero.
- Close the discharge ball valve and watch the pressure/vacuum gauge. The gauge should record pressure (psi). Open the discharge ball valve and the gauge should drop back to zero.
- Press the red stop button to stop the motor.

## 3. Float Switch Controls The Automatic Switching of The Pump Unit From Vacuum to Pressure:

- Press green start switch and vacuum clean water into the tank.
- When tank is full the normally closed float switch will go horizontal. The motor stops for 8 seconds. After the 8 second delay the motor automatically restarts in the opposite direction pressurizing the tank and discharging the contents.
- The motor running in the pressure mode is controlled by the float switch and the discharge run timer. Once the float switch returns to the vertical position the discharge run timer starts. When it times out the motor stops for 8 seconds. After 8 seconds the motor reverses and starts up in the vacuum mode. The discharge run timer can be adjusted to keep the motor running in the pressure mode long enough to empty the tank. Installations with high discharge heads may require more time to empty the tank. Turning the dial on the discharge run timer clockwise will increase the time.
- This cycle from vacuum to pressure mode will continue until the red stop switch is pushed or the run timer times out.

## Setting Vacuum/Pressure Regulators:

### WARNING

**Depressurize System Before Removing Any Parts.  
Never Adjust The Pressure Relief Regulator When The System Is On & There Is A Pressure Reading On The Gauge. The Adjusting Nut Could Blow Off And Cause Serious Injury**

### 1. Check regulator settings

- Regulators have been factory set at 15" hg vacuum and 10 psi pressure.
- Close the ball valves at the top and bottom of the tank. Run the VacuMaster in vacuum for 2 to 3 minutes and record the gauge reading. Then run the VacuMaster in the pressure mode for 2 to 3 minutes and record the gauge reading.

### 2. Reset regulators per the following instructions:

#### ● Adjust Pressure Regulator 1

Step 1 Close inlet and discharge ball valve.

Step 2 Run VacuMaster in the pressure mode. Record pressure reading, turn system off. **Allow Tank To Depressurize. Do Not Adjust Pressure Regulator With System On. Regulator Adjusting Screw Could Blow Loose and Cause Bodily Injury.**

Step 3 Loosen locking nut counter clockwise.

Step 4 If pressure setting is too low, turn knurled hub clockwise to increase pressure at which valve opens. If pressure is too high, turn hub counter clockwise.

Step 5 Tighten locking nut. Turn on system.

Repeat steps 2-5 until pressure is set.

#### ● Adjust Vacuum Regulator 2

Step 1 Close inlet and discharge ball valve.

Step 2 Run VacuMaster in the vacuum mode. Record vacuum reading, turn system off. **Allow Tank To Depressurize. Do Not Adjust Pressure Regulator With System On. Regulator Adjusting Screw Could Blow Loose and Cause Bodily Injury.**

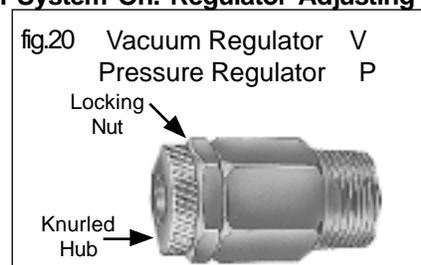
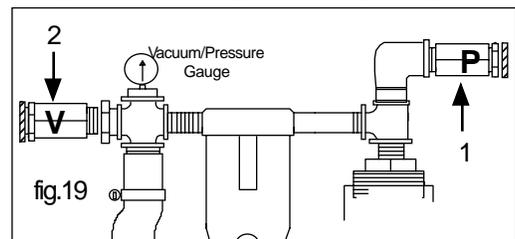
Step 3 Loosen locking nut counter clockwise.

Step 4 If vacuum setting is too low, turn knurled clockwise to increase pressure at which valve opens. If vacuum is too high, turn hub counter clockwise.

Step 5 Tighten locking nut. Turn on system.

Repeat steps 2-5 until vacuum is set.

**Tools:**  
Adjustable Crescent Wrench  
Channel Locks

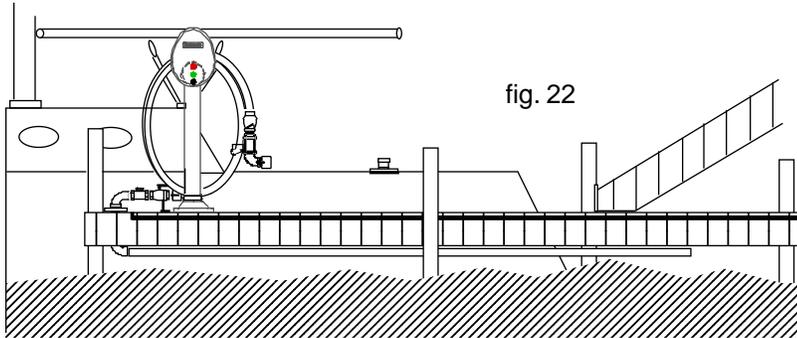


## Pumping Out

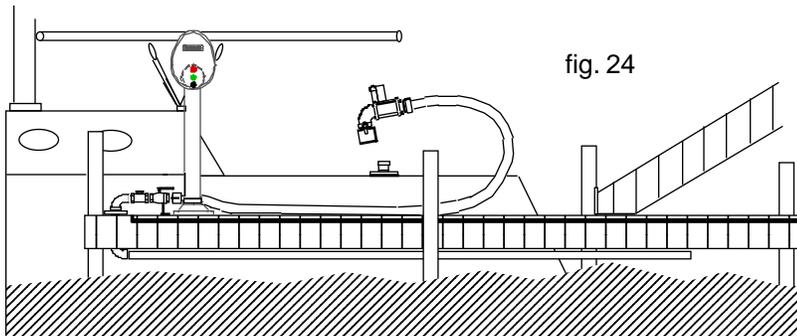
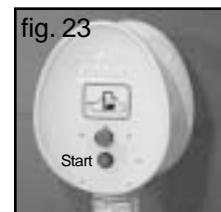
1. **Make Sure Hydrant Ball Valve Is Open & Hose Ball Valve is Closed.**
2. **Prepare The Waste Deck Fitting On the Boat.**
  - Remove the cap from the deck fitting.
  - Screw in a deck adapter, 1 1/2" or 1 1/4".
  - If neither fit, clamp the universal nozzle to the hose.
  - If pumping out a portable holding tank or bucket, clamp the potty wand to the hose.



fig. 21



3. **Turn On The Pump Out System.**
  - Push the green start button
4. **Connecting The Hose To The Boat**
  - Unwind the hose all the way from the hose stand.
  - Clamp the hose to the deck adapter or hold the universal nozzle in the deck fitting.



5. **Open The Ball Valve Slowly & Pump Out.**
  - When the holding tank is empty, close the ball valve.
  - Pump water through your toilet into the holding tank.
  - Pump out again. This procedure rinses the entire system and helps to prevent odor.
  - Close The Ball Valve & Disconnect The Hose
6. **Flush the Hose.**
  - Put the hose into water & open the ball valve for 10 sec.
  - Lift the hose and close the ball valve.
  - Push the Red Stop Button.
7. **Clean Up.**
  - Curl the hose onto the hose stand.
  - Secure the boat deck fitting.
  - Rinse the deck and pump out with water.
  - Wash your hands.

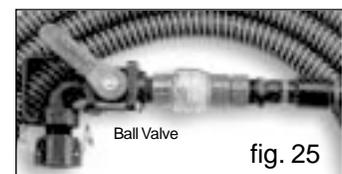


fig. 25

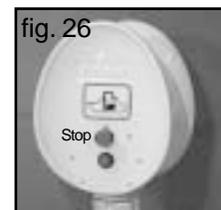


fig. 26

# Parts

## Vacuum Unit

- 1 EDTK060FS Tank Assembly, 60 gal - (See Page 15)
- 2 EDCT 3HP Control Panel - Float Switch Operation (See Pages 7-9)
- 3 EDOLUN0301 3HP Motor, Model 03 Pump & Oil Reclaimer (See Pages 16-17)

## Hose Stand 260-284

- 4 646-7hex Hex Head Aluminum Bolts
- 5 A-1705 Momentary Mushroom Switch Red
- 6 A-1704 Momentary Switch Green
- 7 A-1693-2 Pump-Out Instruction Sign
- 8 A-1693-3 Pump-Out Logo Sign

## Bronze Hydrant 270BR-150 *(Optional Part. Applicable If Ordered See Packing List or Purchase Order)*

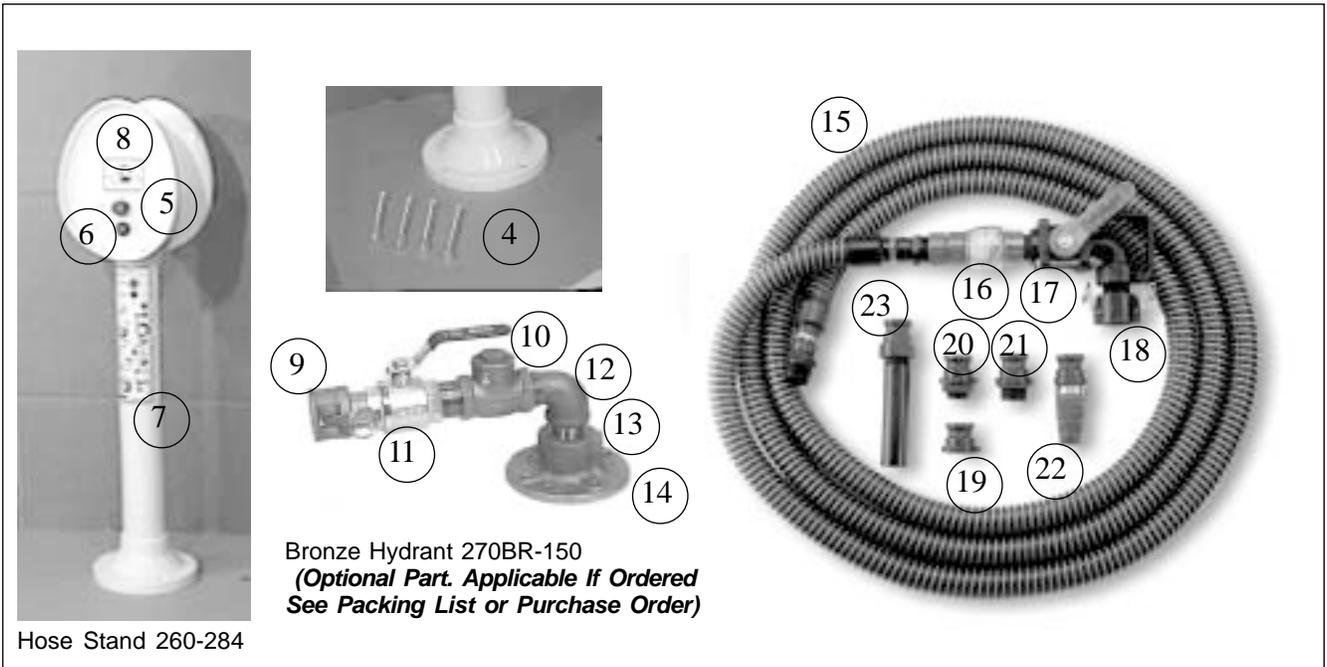
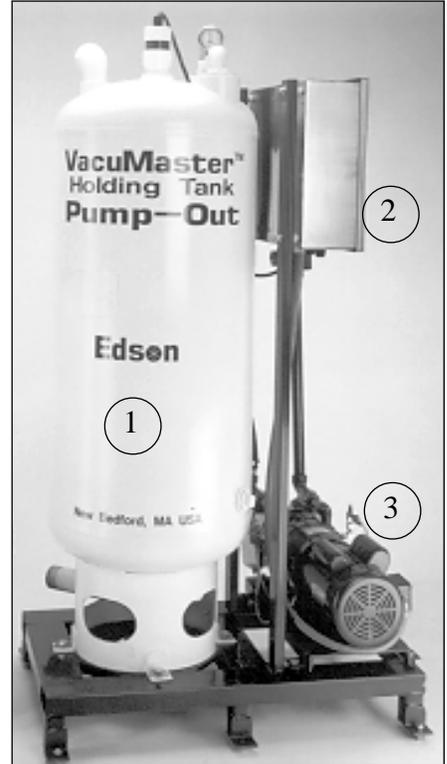
- 9 152MF-150BR Quick Clamp Adapter 1 1/2" FQC X MNPT
- 10 269BR-150 Bronze Swing Check Valve
- 11 264-150BR Ball Valve 1.5" Brass
- 12 A-0000 90 Degree Street Elbow Bronze
- 13 A-0000 1 1/2" Close Nipple, Bronze
- 14 A-0000 Threaded Bronze Mounting Plate

## Hose Assembly 261-25-150

- 15 262-25-150 Hose
- 16 269CL-150 Clear Swing Check Valve
- 17 264-90-150 90 Degree Ball Valve 1.5"
- 18 152FM-150NY Quick Clamp Adapter 1 1/2" FQC X MNPT
- 19 158MF-150NY Quick Clamp Adapter 1 1/2" MQC X FNPT

## Pump Out Adapters

- 20 273-150 1 1/2" Deck Adapter
- 21 273-125 1 1/4" Deck Adapter
- 22 272QC-150 QC Pump Out Nozzle
- 23 274-150 Potty Wand



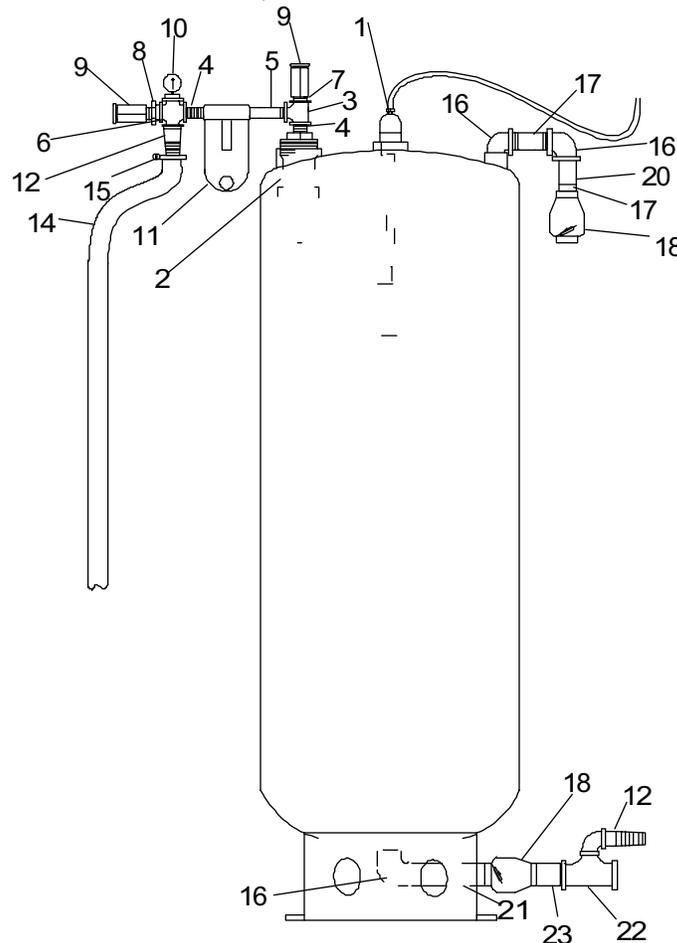
Bronze Hydrant 270BR-150  
*(Optional Part. Applicable If Ordered See Packing List or Purchase Order)*

Hose Stand 260-284

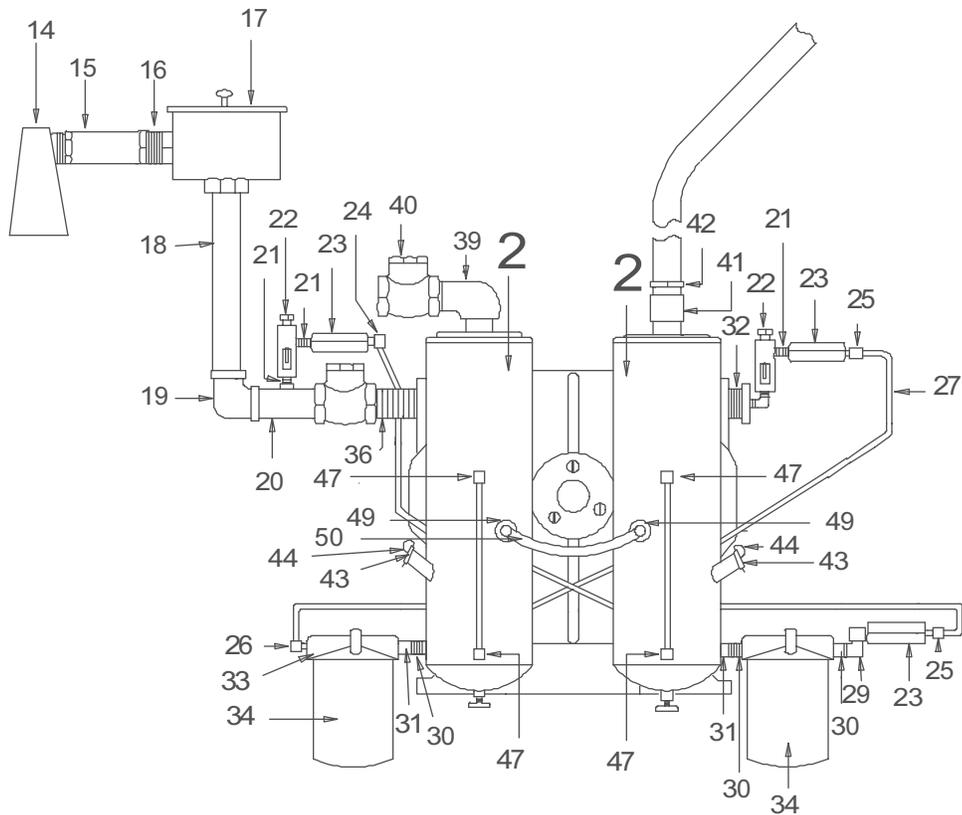
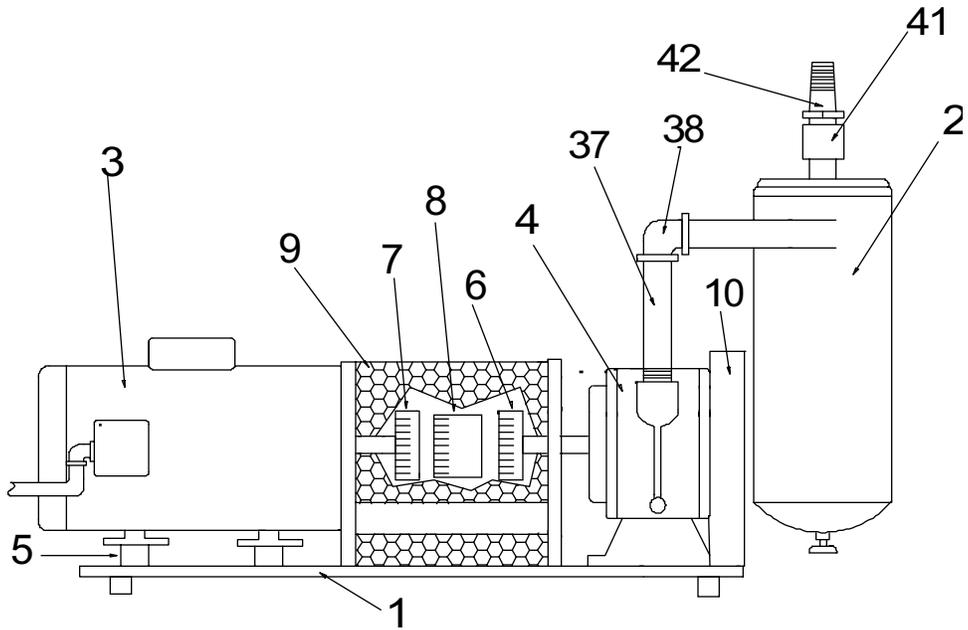


**SUBASSEMBLY - EDSON TANK ASSEMBLY, 60 GALLONS FS - # EDTK060FS**

ITEM	PART NO.	DESCRIPTION	QTY
1.	EDPA060FS	EDSON FLOAT SWITCH ASSEMBLY - 60 GALLON	1
2.	EDPT601120	EDSON PRIMARY TRAP	1
3.	PFTG107510	TEE GALVANIZED 1 X 3/4" X 1"	1
4.	PFNGC100	NIPPLE, CLOSE GALVANIZED 1"	2
5.	PFNG100013	NIPPLE, GALVANIZED 1 X 13" SCHEDULE 40	1
6.	PFTCG100	CROSS GALVANIZED 1"	1
7.	PFBG100025	BUSHING, GALVANIZED 1 X 1/4	1
8.	PFBG100075	BUSHING, GALVANIZED 1 X 3/4	1
9.	RVP10	PRESSURE/VACUUM RELIEF VALVE	2
10.	GAGE012	GAUGE, VAC/PRESS. LIQUID FILLED	1
11.	LWTR02	1" NPT POLY TRAP W/BALL	1
12.	PFBHB100100	HOSE BARB 1" X 1" NPT, BRASS	3
13.	PFPG150	PIPE PLUG, GALV 1-1/2"	2
14.	HOSELWP100	HOSE 1" PETROLEUM	7
15.	CLAMP020	CLAMP SS T20 (620-020)	4
16.	PFEGS200	STREET ELBOW, GALVANIZED 2"	3
17.	PFNG200600	NIPPLE, GALVANIZED 2" X 6" SCHEDULE 40	1
18.	PFCV200P	CHECK VALVE 2", CLEAR PLATIC	2
19.	1PVAD200A	PVC CLEANOUT ADAPTOR 2"	3
20.	1PVN200250	NIPPLE, PVC 2 X 2-1/2"	1
21.	PFNG200800	NIPPLE, GALVANIZED 2 X 8"	1
22.	PFTG202010	TEE GALVANIZED 2 X 2 X 1	1
23.	PFNGC200	NIPPLE, CLOSE GALVANIZED 2"	1
24.	PFEGS100	STREET ELBOW, GALVANIZED 1" 90 DEG	1







**Oil Recycler**

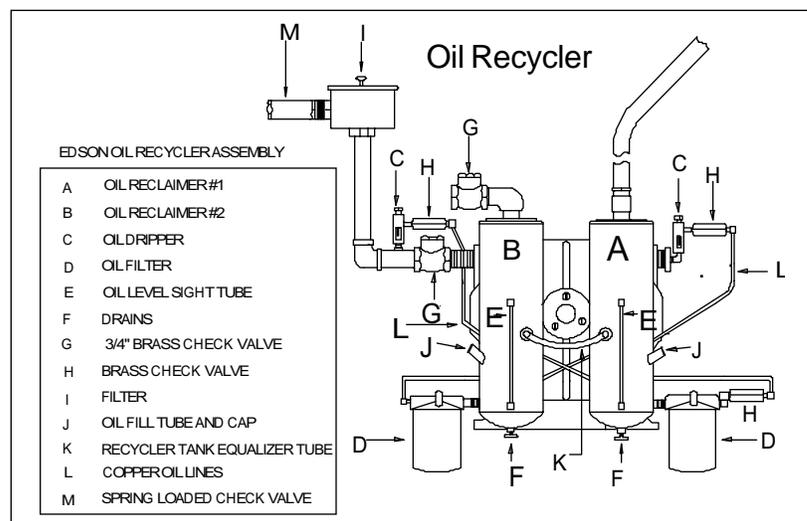
**WARNING**

Pressure Gauge Must Read 0 (Zero)  
Oil Recycler Is Under Pressure When The Vacuum System Is On. Do Not Try To Fill, Open Or Remove Any Component of the Oiler While The System Is On. Injury Could Occur As A Result.

**IMPORTANT**

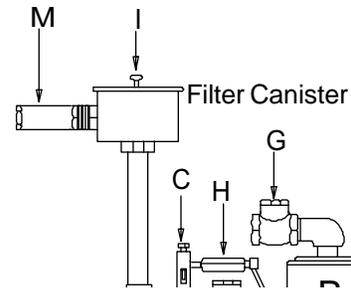
Use High Detergent 10W-30 or 10W-40 Motor Oil Only  
Using the wrong oil or dirty oil can cause loss of vacuum or pump failure.

- **Check Oil Level Regularly** - add oil as required to maintain level.
- **Check for Excessive Moisture** & draining off excess water via the drains at the bottom of the reclaimer ( F ). It is the nature of this oiler reclaimer that a small amount of water will mix with the oil. The oil in the sight tube will appear cloudy due to picking up air and water as it passes through the pump and is reclaimed. Since water is heavier than oil excess water will settle to the bottom of the recyclers. Drain until a small amount of oil appears in a clear glass. If more than an ounce water drains out the oil and filters should be changed.
- **Change the Oil and Filters ( D )** twice a year if system is used year round or once a year if use is seasonal. Drain oil before removing filters.
- **Check Oil Drippers.** Drippers have been preset at the factory to allow approximately one drip of oil to enter the system every five ( 5 ) seconds. If they need to be reset follow these instructions.
- **Setting Oil Drippers ( C )**
  - Vacuum Dripper
    - a. Start the unit in the vacuum mode and shut off the inlet ball valve.
    - b. Let the unit build up to maximum vacuum.
    - c. Vacuum dripper is on the back side of the pump, closest to the waste tank.
    - d. Unscrew the locknut on top of the dripper. With a slot-head screwdriver, unscrew the dripper jet by turning it in a counter clockwise direction. Turn the jet until the oil line fills with oil to the dripper. Then slowly tighten the jet in a clockwise direction until dripper is dripping about one drop every 5 seconds. Replace the lock nut and tighten in a clockwise direction.
  - Pressure Dripper
    - a. Start the unit in the pressure mode and shut off the discharge ball valve.
    - b. Pressure dripper is on the back side of the pump, closest to the waste tank.
    - c. Unscrew the locknut on top of the dripper. With a slot-head screwdriver, unscrew the dripper jet by turning it in a counter clockwise direction. Turn the jet until the oil line fills with oil to the dripper. Then slowly tighten the jet in a clockwise direction until dripper is dripping about one drop every 5 seconds. Replace the lock nut and tighten in a clockwise direction.



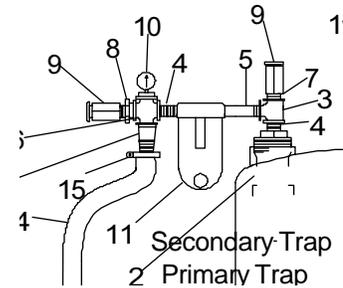
### Air Filter

- **Check Periodically** - Replace as required. Order# 161-A-1629-A  
The air filter is found inside the canister ( I ). It is a cartridge filter that removes particles from ambient air when the vacuumaster is in the pressure mode.



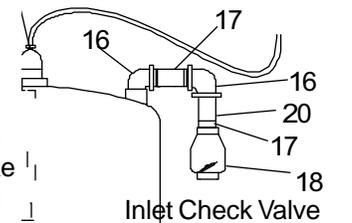
### Moisture Traps

- **Visual Check Daily**- The Edson unit is equipped with a primary ball and cage shut off which is built into the tank. This primary shut off will shut off the vacuum line to the pump in the event the level control probe fails. A secondary clear bowl moisture trap is installed on the tank to pump line in case any moisture or waste gets past the primary shut off. This clear bowl trap should be checked periodically for moisture and drained accordingly.

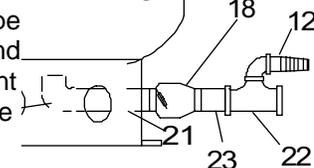


### Check Valves

- **Visual Check Daily**- Each Edson unit is equipped with two clear 2" check valves. (Some Applications require BRONZE CHECK VALVES)  
The check valves are designed to operate automatically, opening and closing when the unit switches from vacuum to pressure mode. In the vacuum mode, the check valve mounted near the top to the tank should be open. If the unit is not pumping properly or pumping is taking longer than normal, the intake check valve should be checked to see if any debris is keeping it from opening completely. Because the check valve is clear, a visual inspection to determine any problems is easy. If the intake check valve is functioning properly, the outlet check valve should be viewed to see if it is closing properly during the vacuum mode. If debris is preventing the outlet check valve from properly sealing, exhaust waste can be sucked back into the unit, filling the tank prematurely and affecting vacuum levels. The outlet check valve is also clear for easy inspection. if the unit does not discharge properly, the outlet and inlet check valves should also be inspected for clogging.



Discharge Check Valve

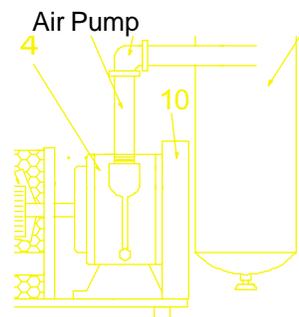


If a check valve is clogged, it may be removed for cleaning. The check valves are screwed in using regular NPT threads. Since the check valves are plastic, care should be taken while unscrewing them with a standard pipe wrench. It is a good idea to install two shut off ball valves in front and behind the discharge check valve during installation. This insures a minimal amount of mess while removing the discharge check valve in the event that either the tank or the discharge line is full of waste.

### Air Pump

- **As Required** - The air pump is a combination vacuum/pressure pump. It is built for years of service. The only maintenance required is to keep the oil reservoirs full so that the pump does not run dry and to drain any moisture from the recyclers and the secondary trap.

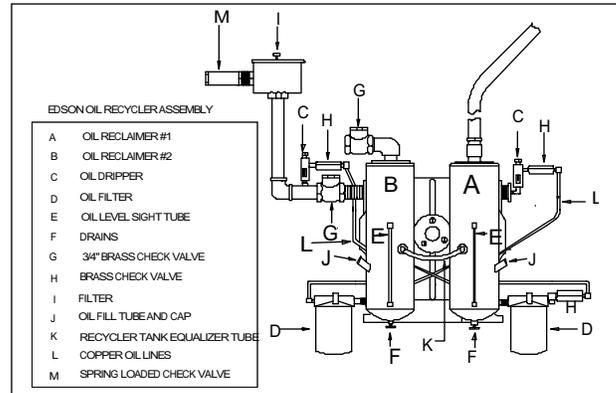
If the air pump rotor or vanes becomes locked up, it will be necessary to flush the vane chamber with kerosene and then change the oil in the recyclers and replace the oil filters.



## Flushing The Air Pump

P-290-60-2420FS-99 pg. 20

- Unscrew Filter Cap nut, remove filter cap and the filter.
- Pour about 1/2 cup of kerosene into the filter canister. It will drain down into the **pump**.
- Press the Off Load Button and let the pump run in the pressure mode for about 15 seconds. If pump will not run let the kerosene sit for two hours. Try and turn the pump by hand. If it still will not turn, wait one day. If after one day the pump will not turn over, the pump must be disassembled and cleaned.
- After running kerosene through the pump the Oil Recyclers must be drained and refilled.



## Trouble Shooting

### Condition: No Vacuum At The Pump Out Hose

After pressing the green start button and waiting approximately 2 minutes before opening the pump out hose ball valve, there is no indication of a vacuum. Close ball valve on the hose and see Steps below.

#### Isolating The Problem

##### Step 1 - Check motor. Push green start button at the pump unit.

1. Motor is not running. See Electrical & Level Control.
2. Motor is running in vacuum mode but there is low or 0 vacuum reading on the pressure gauge at top of the tank. Proceed to Step 2

##### Step 2 - Check for tank pressure leak. Close inlet and discharge ball valves on the tank.

1. Vacuum gauge stays the same. Check air pump by removing tank hose from pump. If no vacuum at air pump port, flush air pump with kerosene ( See Maintenance - Flushing Air Pump.). If strong vacuum at air pump, there is an air leak or a blockage in the tank air line plumbing. Check the regulators, primary and secondary traps and exhaust line.
2. Vacuum gauge builds vacuum to regulator preset. Proceed to Step 3

##### Step 3 - Isolate pressure leak. With unit running in vacuum open discharge ball valve.

1. Vacuum gauge drops. Clean Discharge Check Valve .
2. Vacuum gauge holds vacuum to regulator preset. Proceed to Step 4

##### Step 4 - With unit running and pump out hose ball valve closed open tank inlet ball valve.

1. Vacuum gauge drops. Check for break in suction line. See Plumbing
2. Vacuum gauge holds vacuum to regulator preset. Go back to work.

### Condition: The Secondary Trap Is Filled With Waste Water

This condition would indicate that the float switch may not have shut off the motor or may be set to high.

#### Step 1 - Check float switch operation:

1. Turn off main power and remove float switch assembly from the top of the tank.
2. Turn on the unit in the vacuum mode and manually activate the float switch. If the pump unit does not shut off, replace the float switch. If the pump does shut of and does restart in the pressure mode, adjust the float switch height inside the tank lower.

### Condition: Oil Recycler Oil is White In Color

This is a natural effect of the oil reclaiming process and it cause by moisture emulsified in the oil.  
See Maintenance - Oil Recycler