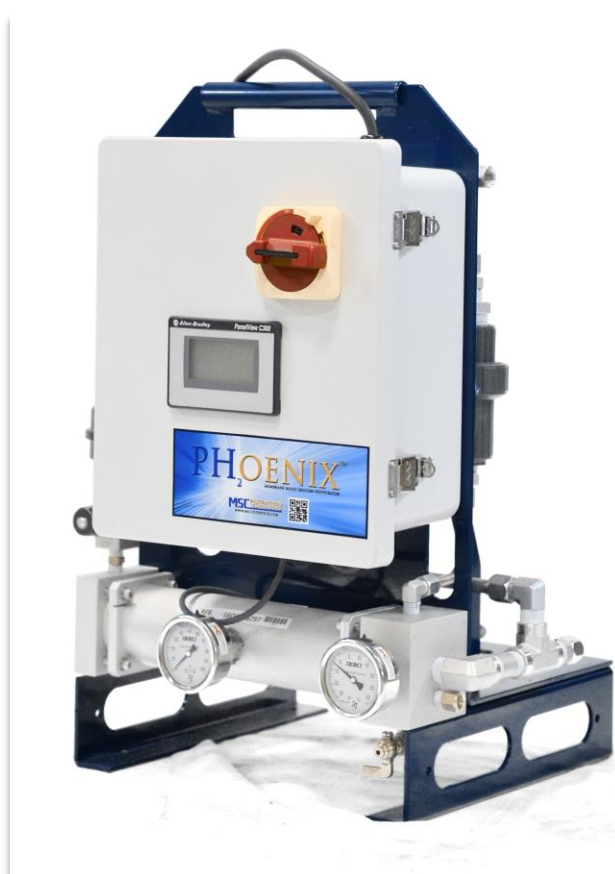


**IMPORTANT: READ THIS MANUAL THOROUGHLY BEFORE INSTALLING AND OPERATING UNIT**



## PHoenix-M (Mini) PORTABLE LUBE AND HYDRAULICS OIL PURIFIER OWNER/OPERATIONS MANUAL

Rev 8– 03232016KB

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# SECTION 1

## PHOENIX-M SPECIFICATIONS

MAX FLOW RATE:	1 GPM
MAX OPERATING VISCOSITY	15 cSt to 1000 cSt
FLUID/OIL COMPATIBILITY	MINERAL BASED, PAO AND POLYOLESTER (Phosphate Ester Membrane Optional)
MAX RECOMMENDED OPERATING PRESSURE	30 PSIG
MAXIMUM MODULE PRESSURE	100 PSIG
MIN/MAX OPERATING AMBIENT TEMP	0 – 50 C
MIN/MAX STORAGE TEMP	- 20 – 60 C
MIN/MAX OPERATING FLUID TEMP	- 15C – 90 C
EMPTY WEIGHT	35- LBS NO AQUATREX 55- LBS WITH AQUATREX
INLET/OUTLET CONNECTIONS	½" Male JIC
DIMENSIONS	14 ½ L X 13 7/8" W X 24 ½" H
VOLTAGE	110 V or 220 V
MAX AMPERAGE DRAW	5 AMPS

## SECTION 2:

### PHoenix (Mini) Portable Lube and Hydraulics Oil Purifier

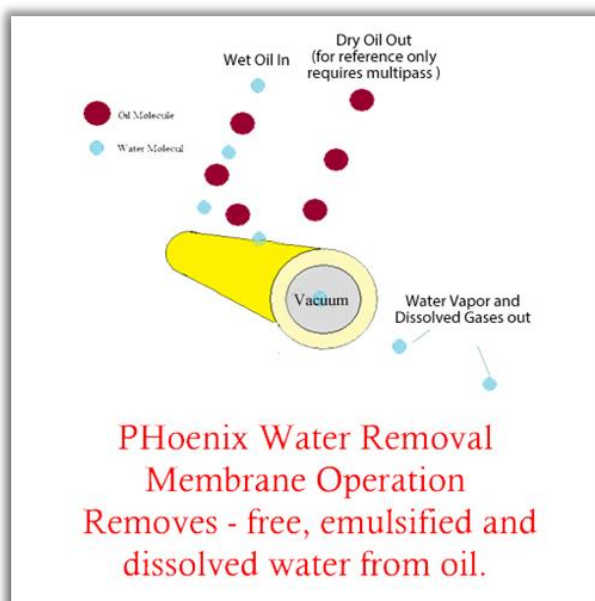
#### (Description and Operation)

The Phoenix –M oil purifier's is a small, compact simple and portable 110V oil purifier. Some of the typical applications for the Phoenix-M are water removal from oil in Gear Boxes and also small Hydraulic reservoirs and other lube oil systems. The Phoenix has the capability to remove free, emulsified and dissolved water from lube and hydraulic systems of between 5 and 150 gallons. The Phoenix-M is not supplied with its own fluid pump but is designed to work in conjunction with a gear box online filter pump skid or also downstream of a portable filter cart which can provide oil pressure and flow through the unit. This purifier can be purchased with a fluid pump as a portable cart under the part number PHoenix-C.

The PHoenix utilizes a cutting edge hollow fiber membrane bundle to remove water from oil. Moisture is pulled out of the oil by a vacuum as wet oil passes across the outside of the membrane. A vacuum created by a supplied vacuum pump pulls moisture through the membrane where it is expelled as vapor from the vacuum pumps exhaust port. The membrane is olyophobic and so mostly only water can pass through. Water levels as low as 25 ppm are achievable depending on oil sump size and water ingress levels. This cutting edge water removal membrane has no limit to the quantity of water it can remove and requires minimal maintenance and operator attention. It should provide years of worry and trouble free operation before replacement.

**IMPORTANT NOTE: The membrane bundle is not serviceable in the field and should be returned to point of purchase for replacement when its useful life is complete. Never try to disassemble the membrane housing in the field or damage to the bundle may occur.**

See figure 1 below for further description.



**Disclaimer:** Photo is illustrative. The membrane is not claimed as defect free and there may be very slight oil carryover to the vacuum side. This does not however effect the performance or many benefits of the Phoenix Purifier. Water Removal is multi-pass and requires several passes of oil across membrane to be fully effective.

## (SECTION 2: Description and Operation - Continued)

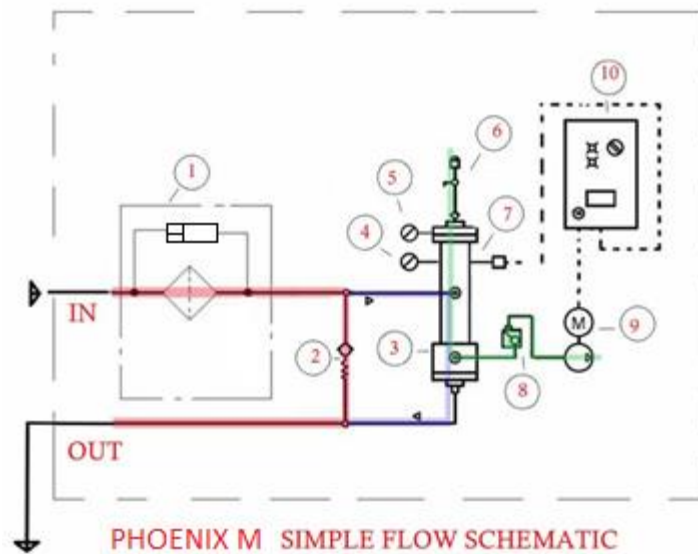


Figure 2:

Wet oil passes into the PHoenix-M through (Item 1) a particulate filter housing. This filter housing has filter plugged indicator installed which moves a white indicator from green to red when filter life has been reached.

**IMPORTANT NOTE: You should never run oil through the Phoenix purifier without an MSC approved filter installed or upstream of the PHoenix. Failure to do so can cause permanent damage to the water removal membrane bundle which may then require premature replacement.**

Oil then passes into (item 3) the water removal membrane filter housing. A 20 psid spring loaded check valve (Item 2) is piped in parallel with the water removal membrane housing. This provides pressure relief across the membrane bundle in the event of excess flow or oil viscosity. The membrane housing should not be subjected to pressures in excess of 20 psig total pressure however (Item 2) the relief limits the total pressure drop possible across the membrane bundle to about 10 – 15 psid.

This total pressure may be read from the (item 4) 0-100 psig liquid filled pressure gauge installed on the front of the membrane housing. After oil enters the housing it is forced across the water removal membrane and then exits the housing. Water is removed from the oil as it passes across the membrane. If the spring loaded bypass (item 2) is open, then the flow from the membrane housing will recombine with the partial non dewatered relief flow passing through the check valve. Both combined flows exit the purifier and return to the oil reservoir. See figures 3 and 4 on the next page for further information.

## (SECTION 2: Description and Operation - Continued)

A vacuum is generated by the (item 9) vacuum pump which pulls sweep air through (item's 6) the (vent filter, vacuum control valve and leak prevention check valve) and then through the center of the membrane hollow fiber. (Item 8) An air eliminator is installed between the membrane housing and vacuum pump in order to prevent any oil leakage to the vacuum side in the event that the membrane is compromised. (Item 8) and the check valve installed in (Item's 6) allow the Phoenix-M to automatically seal itself completely off in the unlikely event of a membrane break or rupture. See figures 3 and 5 below showing sweep air flow for further information.

The total vacuum generated by (Item 9) vacuum pump is controlled by manually throttling down on the control valve located on item's 6 and value is monitored on the vacuum gauge (item 5). Vacuum is typically set between 20" and 23" of mercury. There is a site glass and brass petcock drain valve located on the membrane housing to see and drain any potential liquid condensation from the line.

### OPTIONAL AQUATREX WATER MONITORING SYSTEM

An optional water sensor (item 7) which reads the relative humidity of the incoming oil up to 100% saturation may be supplied with the membrane housing. This in addition with the optional Aquatrex PLC (item 10) allows operators to view the relative humidity of their oil in % saturation in real time. The optional AQUATREX system also allows operators to set low and high water set points which can control the vacuum pump run time based on necessity. A resettable vacuum pump run time meter and a cycle count meter in the Aquatrex PLC program allows operators to track water ingress rates into their equipment. This option makes the Phoenix-M not only an oil purifier but also a piece of diagnostic equipment for water ingress rates.

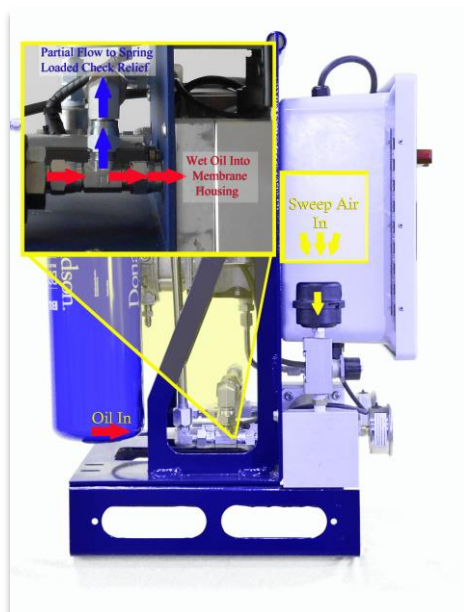


Figure 3

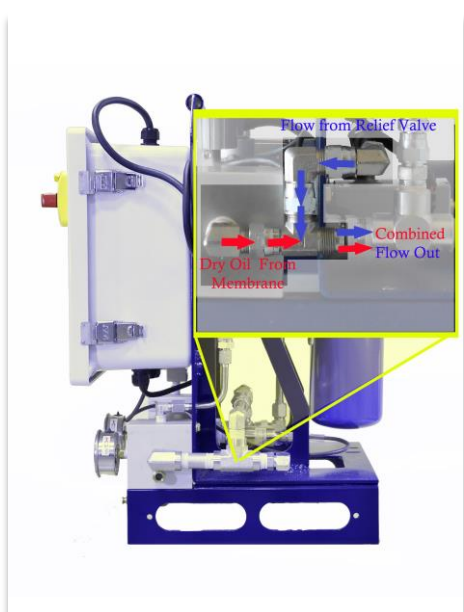


Figure 4



Figure 5

## SECTION 3:

### PHOENIX-M COMPONENT LIST AND DESCRIPTION

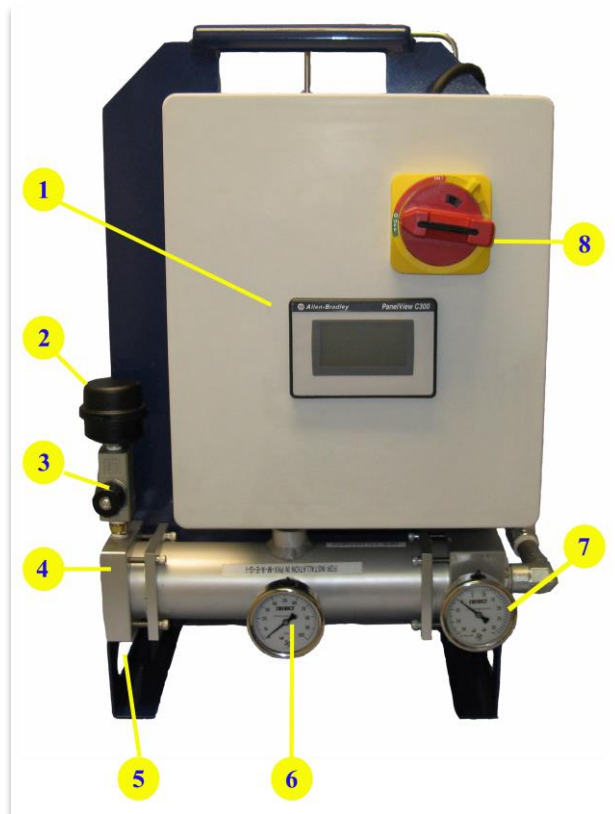


Figure 6

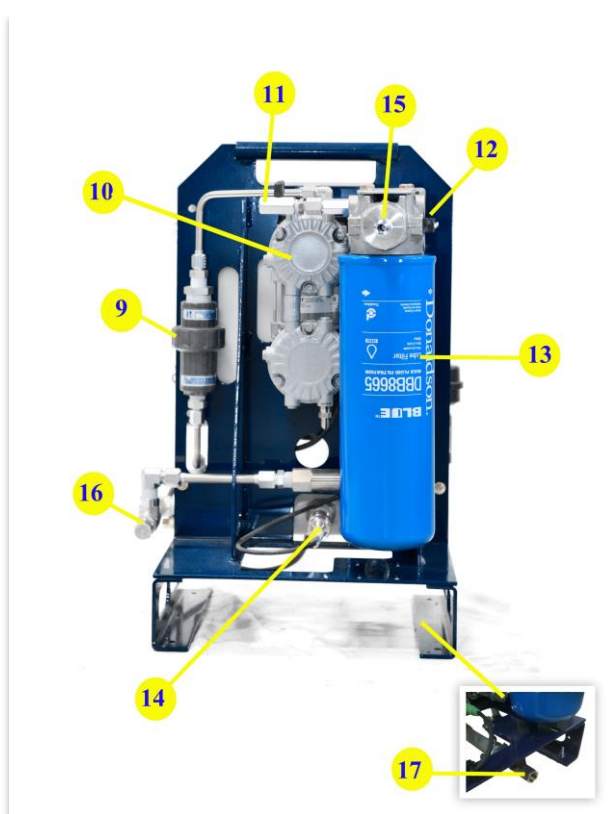


Figure 7

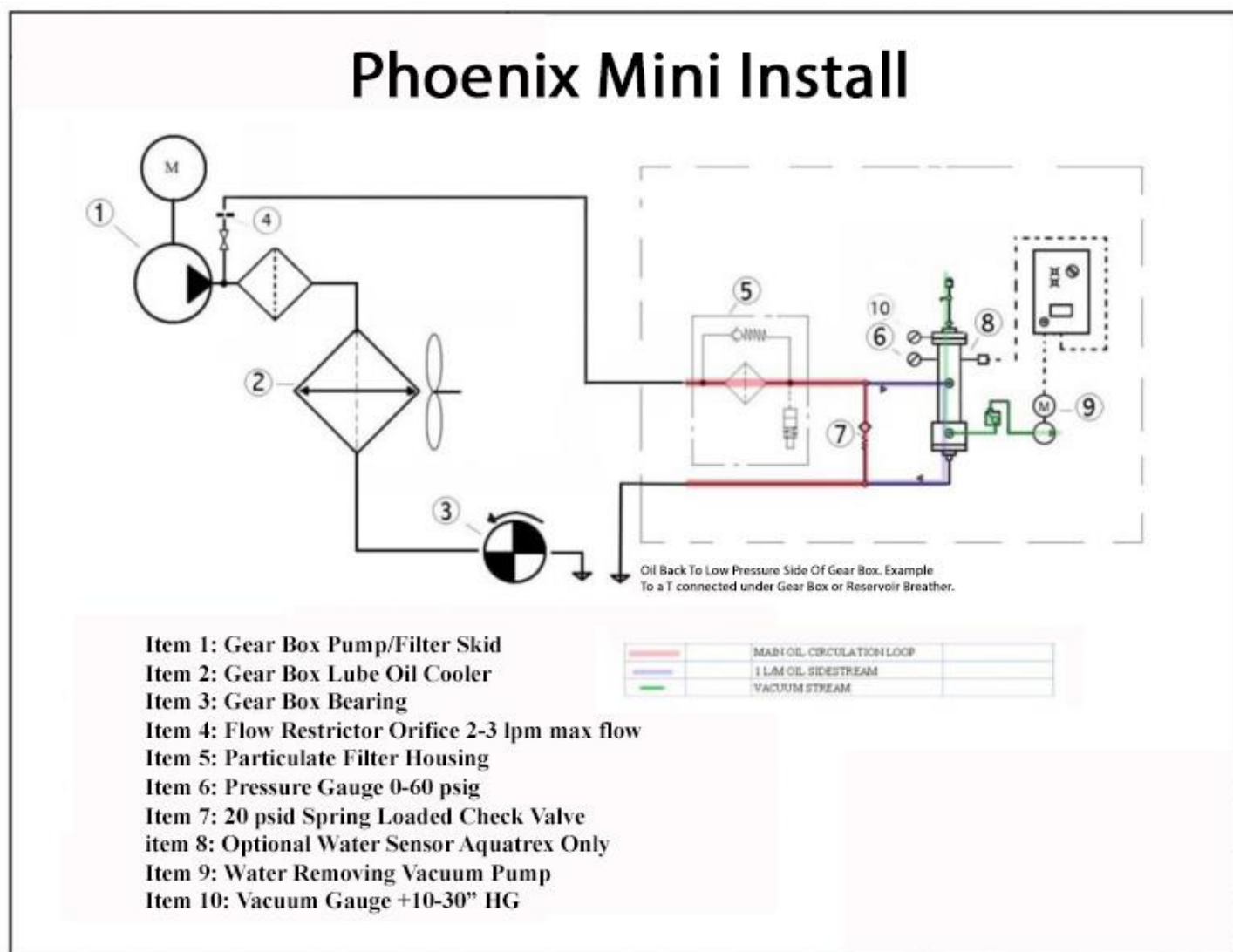
Item	Description
1	Optional Aquatrex Control Panel
2	Vacuum Vent Filter
3	Vacuum Control Valve
4	Water Removal Membrane Housing
5	Optional Removable Magnetic Rails
6	0-100 PSIG Inlet Gauge
7	0-30 Vacuum Gauge
8	Optional Aquatrex On Off Switch
9	Vacuum Line Leak Preventer
10	Gast Model SAA-V108-NQ Dual Stage Vacuum Pump
11	Oil Sample Valve
12	Particulate Filter Plugged Indicator
13	7 Micron Beta 2000 Spin On Particulate Filter
14	Optional Water Sensor Only Included with Aquatrex Option
15	Phoenix Mini Inlet 1/2" JIC
16	Phoenix Mini Outlet 1/2" JIC
17	Optional Condensate Drip Leg. Turn off Unit to Open



## Section 4:

### UNIT 4 STEP INSTALLATION AND STARTUP

Step1. Connect the phoenix min to a partial side stream as the example shows. Inlet should be off of a pressure port somewhere downstream of a main lube oil pump and return should be to 0 pressure of the reservoir. A good place to return the phoenix is off of a T just downstream of the inlet reservoir breather. Contact your local phoenix representative for help if necessary.

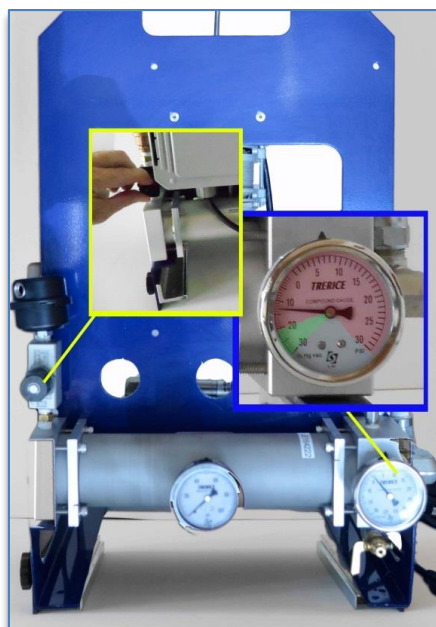


Step2. Use a flow control orifice see item 4 in picture above or a restrictor valve on the inlet to the phoenix to limit flow to less than 1gpm. Contact your local phoenix representative for help if necessary.



## UNIT 4 STEP INSTALLATION AND STARTUP (Continued)

Step 3. Generate oil flow through phoenix. Check pressure gauge on membrane housing to insure pressure does not exceed 30 psig. If it does restrict oil flow more till pressure is less than 20 psig.



Vacuum Adjustment



Non Aquatrex Unit Start Stop



Aquatrex Supplied Unit Stop Start

Step 4. Plug Phoenix into 110-volt supply line and initiate power by throwing rocker switch on power cord or power switch on optional Aquatrex Control Panel). Adjust vacuum level using vacuum control valve and adjust vacuum gauge to between 25 and 27" of mercury. Do not close control valve all the way – some sweep air is needed to pull moisture out of the oil.

## SECTION 5:

### PHoenix-M PREVENTATIVE MAINTENANCE AND RECOMMENDED SPARE PARTS

**IMPORTANT NOTE:** There is very little preventative maintenance required for the PHoenix. The amount required is limited to the vacuum pump, and replacement of the USRT particulate filter and the inlet breather filter. There is no maintenance required on the water removal membrane which **is not field serviceable**.



#### RECOMMENDED SPARE PARTS LIST

PART NUMBER	DESCRIPTION	REPLACEMENT INTERVAL
PHX-C4KIT  PHOENIX SUPPLIED WITH DUAL STAGE VACUUM PUMP MODEL SAA-V109- NQ ONLY	PM KIT INCLUDES TWO SEAL KIT AND ONE BREATHER FILTER. SEE SECTION 9 DATA SHEETS FOR PM REBUILD INSTRUCTIONS	12-24 Months of operation
MSCDBB8665	7 MICRON PARTICULATE FILTER REPLACEMENT	Replace every 6 months or earlier if needed. Check filter plugged indicator page 5 item 11 regularly.

## SECTION 6:

### OPTIONAL AQUATREX SYSTEM PLC TOUCHSCREEN OPERATION



#### Description:

The optional Aquatrex touchscreen and water sensor provide several unique tools to understand and track the water ingress levels in a lube or hydraulic system. The PHoenix-M's touchscreen provides the ability to read water contamination in real time in percent saturation (up to 100%). In addition, the Aquatrex allows high and low water set points to be manually programmed into the PLC allowing it to automatically turn on or off the water removing vacuum pump depending on the amount of water in the oil. There is also a resettable vacuum pump run time meter and a cycle counter to track how long and how often the vacuum pump needs to run to remove any water present in the oil. This feature allows operators to track the performance of the PHoenix-M over time and monitor the amount of ingress into a system.

## (SECTION 6: PLC Touchscreen Operation - Continued)

## READING WATER LEVELS



1. ACCESS THE WATER SENSOR SCREEN BY PUSHING THE MAIN MENU



2. THE % SATURATION OF WATER IN THE OIL IS DISPLAYED IN REAL TIME IN THE WATER SENSOR MENU.



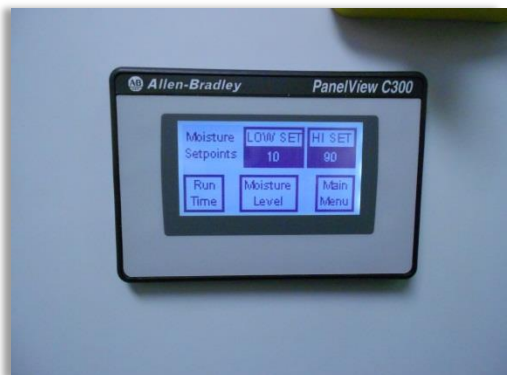
3. IF THE % SATURATION VALUE IS BETWEEN THE HIGH AND LOW SET POINTS YOU CAN START THE VACUUM PUMP CYCLE BY MANUALLY PUSHING THE CYCLE START BUTTON



4. YOU CAN ALSO MANUALLY STOP THE VACUUM PUMP BY HITTING THE CYCLE STOP BUTTON. THE VACUUM PUMP WILL STAY OFF UNTIL THE % SATURATION INCREASES ABOVE THE HIGH WATER SET POINT IN SET POINT MENU

## (SECTION 6: PLC Touchscreen Operation - Continued)

## HIGH AND LOW WATER SET POINTS



1. ACCESS THE WATER LEVEL SET POINTS FROM THE MAIN MENU BUTTON



2. YOU MAY SET EITHER THE HIGH OR LOW SET POINTS BY PRESSING THE HIGHLIGHTED BUTTONS ON THE TOUCH SCREEN. THE WATER REMOVAL VACUUM PUMP WILL AUTOMATICALLY TURN ON WHEN THE HIGH SET POINT IS REACHED AND TURN OFF WHEN THE LOW SET POINT IS REACHED.

IF YOU WISH TO HAVE THE WATER REMOVAL VACUUM PUMP RUN ALL THE TIME REGARDLESS OF WATER LEVELS THEN SET BOTH THE HIGH AND LOW SET POINTS TO 0.

CONVERSELY IF YOU WISH TO NOT HAVE THE VACUUM PUMP RUN REGARDLESS OF WATER SET POINTS THEN SET THEM BOTH TO 100%



## (SECTION 6: PLC Touchscreen Operation - Continued)

## VACUUM RUNTIME METER AND CYCLE COUNTER



1. ACCESS THE RUN TIME AND CYCLE COUNT METER VIA THE MAIN MENU BY PUSHING THE RUN TIME BUTTON.



2. THE TOTAL RUN TIME FOR THE VACUUM PUMP FOR CURRENT SESSION IS SHOWN. THIS TOTAL TIME HAS COMPOUNDED SINCE THE LAST RESET OF THE CLOCK. IN ADDITION, THERE IS A CYCLE COUNTER WHICH RECORDS HOW MANY TIMES THE VACUUM PUMP HAD TO TURN ON AND OFF SINCE THE LAST RESET.



3. BOTH THE RUN TIME METER AND CYCLE COUNTER CAN BE RESET BACK TO 0 USING THE RESET BUTTON.

**IMPORTANT NOTE:** BE SURE TO RECORD THE TIME AND CYCLE COUNT IF NEEDED BEFORE RESETTING SINCE ANY PREVIOUS TIMES OR CYCLES WILL BE LOST.

## SECTION 7:

### TROUBLE SHOOTING GUIDE

This is only a guide. If these recommendations do not solve the problem, please contact your Sales representative for further help.

PROBLEM DESCRIPTION	POSSIBLE CAUSE/SOLUTION
NO POWER TO UNIT	<ul style="list-style-type: none"> <li>• Insure Phoenix-M is plugged into 110V power and make sure there is power to that source.</li> </ul>
LOW OR NO VACUUM ON VACUUM GAUGE DESPITE VACUUM PUMP RUNNING.	<ul style="list-style-type: none"> <li>• See page 7 –on adjusting vacuum control knob.</li> <li>• Check Vacuum Gauge (Section 3, Figure 6, Item 8) to insure it is reading properly. Replace if necessary</li> <li>• See page SECTION 7 DRAWINGS AND DATA SHEETS on replacing vacuum pump seals if over 6000 hrs. of run time.</li> <li>• Shut down Phoenix and open condensate drain valve to see if any liquid is present. If only water is present – drain and start back up.</li> </ul> <p><b>IMPORTANT NOTE: SMALL AMOUNTS OF OIL COULD BE PRESENT IN THE DRAIN LINE PETCOCK ON THE WATER REMOVAL MEMBRANE HOUSING WHICH IS NORMAL AND SHOULD BE INTERMITTENTLY CHECKED AND DRAINED. LARGE AMOUNTS OF OIL CAN INDICATE A COMPROMIZED MEMBRANE AND PLEASE CONTACT YOUR PHOENIX REPRESENTATIVE IN THIS CASE.</b></p>
VACUUM LEVEL HIGH ON VACUUM GAUGE BUT VACUUM LEVEL UNRESPONIVE WHEN VACUUM CONTROL VALVE IS TURNED.	<ul style="list-style-type: none"> <li>• Breather Filter Plugged. See Section 5 for replacement part.</li> <li>• Check inlet check valve just below breather filter to insure it is not stuck shut.</li> </ul>

For Further Technical Support Contact your local Sales representative



SECTION 8:  
DATA SHEETS

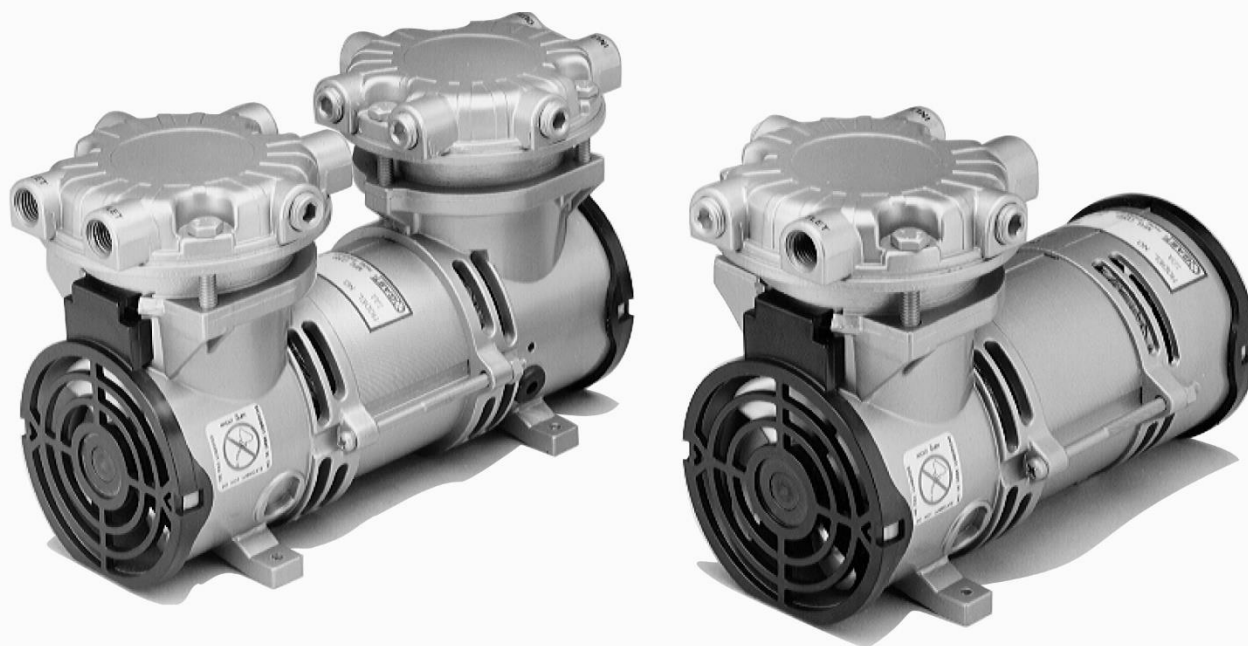
# **GAST**

**A UNIT OF IDEX CORPORATION**



70-7050 G505PL (Rev. E)

## **SOA/SAA/LOA/LAA OIL-LESS VACUUM PUMPS & COMPRESSORS OPERATION & MAINTENANCE MANUAL**




### **CONTENTS:**




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Operation .....	3
Maintenance and Shut-Down Procedures .....	4
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**KEEP THIS DOCUMENT FOR FUTURE REFERENCE**




This is the hazard alert symbol: . When you see this symbol, be aware that personal injury or property damage is possible. The hazard is explained in the text following the symbol. Read the information carefully before proceeding.

The following is an explanation of the three different types of hazards:

-  **DANGER** Severe personal injury or death will occur if hazard is ignored.
-  **WARNING** Severe personal injury or death can occur if hazard is ignored.
-  **CAUTION** Minor injury or property damage can occur if hazard is ignored.

## GENERAL INFORMATION

This unit is designed for moving air only and under no circumstances is to be used with any other gases, fluids, particles, solids, or any substance mixed with air.


-  **DANGER** Pumping flammable or explosive gases or operating this unit in an atmosphere containing them can result in fire or explosion damage to unit and surrounding environment.
-  **CAUTION** Do not allow corrosive gases or particulate material to enter unit. Water vapor, oil-based contaminants, or other liquids must be filtered out. Foreign materials will damage unit by gumming up parts and causing unit to fail.
-  **CAUTION** This unit's exhaust air can become very hot. Hot exhaust air can damage temperature-sensitive equipment and will burn skin if exposed to air stream.

Ambient temperature should not exceed 40°C (104°F). For operation at high temperatures, consult the factory.



Performance is reduced by low atmospheric pressure found at high altitudes. Consult a Gast distributor for details.

Never lubricate this oil-less piston unit. Most components are made of aluminum and valves are stainless steel.

## INSTALLATION


-  **WARNING** To avoid risk of electrocution do not use this product in an area where it could come in contact with water or other liquids.

If exposed to the elements unit must be weather-protected.


-  **WARNING** Beware of any exposed and/or movable parts. Proper guards should be in place to prevent personal and/or property damage.
-  **CAUTION** Do not block flow of cooling air over unit in any way. This will cause unit to overheat.

## Mounting

Unit may be installed in any orientation as long as flow of cool, ambient air over unit is not blocked. To reduce noise and vibration, use shock mounts and affix unit to a stable, rigid operating surface.

-  **CAUTION** Remove plastic plugs in ports before starting unit to avoid flying projectile and/or lack of performance.

## Wiring

-  **WARNING** Incorrect wiring can result in electric shock and cause permanent damage to unit.


Wiring must conform to all required safety codes and be installed by a qualified person. Grounding is required. All power to motor must be de-energized and disconnected when servicing.

## Grounding Instructions

These instructions apply to 120-volt units and where indicated to units wired for 220-240 volts. See motor nameplate on unit for voltage requirements.

### *For all grounded, cord-connected products:*

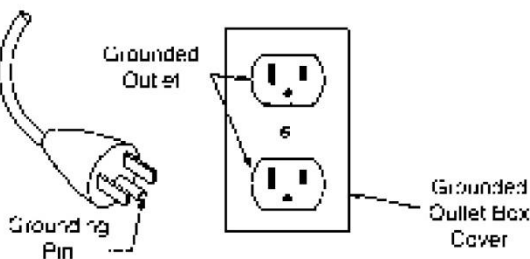
*This product should be grounded. In the event of an electrical short circuit, grounding reduces the risk of electric shock by providing an escape wire for the electric current this product is equipped with a cord having a grounding wire with an appropriate grounding plug. The plug must be plugged into an outlet that is properly installed and grounded in accordance with all local codes and ordinances.*

-  **DANGER** Improper installation of the grounding plug can result in a risk of electric shock. If repair or replacement of the cord or plug is necessary, do not connect the grounding wire to either flat blade terminal. The wire with insulation having an outer surface that is green with or without yellow stripes is the grounding wire.

*Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if in doubt as to whether the product is properly grounded. Do not modify the plug provided; if it will not fit the outlet, have the proper outlet installed by a qualified electrician.*

*For a grounded, cord-connected product rated less than 15 amperes and intended for use on a nominal 120 volt supply circuit:*

*This product is for use on a nominal 120-volt circuit and has a grounding plug that looks like the plug illustrated in Figure 1. Make sure that the product is connected to an outlet having the same configuration as the plug. No adapter should be used with this product*



**Figure 1**

*For all other grounded, cord-connected products:*

*This product is for use on a circuit having a nominal rating more than 120 volts (or 220-240 volts) ...and is factory-equipped with a specific electric cord and plug to permit connection to a proper electric circuit. Make sure that the product is connected to an outlet having the same configuration as the plug. No adapter should be used with this product if the product must be reconnected for use on a different type of electric circuit, the reconnection should be made by qualified service personnel.*

*For a permanently connected product:*

*This product should be connected to a grounded, metallic, permanent wiring system, or an equipment-grounding terminal or lead on the product*

#### **Extension Cords:**

*Use only a 3-wire extension cord that has a 3-blade grounding plug, and a 3-slot receptacle that will accept the plug on the product. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy, enough to carry the current your product will draw. For lengths less than 25 feet, No. 18 AWG extension cords should be used. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating.*

*Exception: A 2-conductor or 3-conductor extension cord may be used for a double-insulated or 2-wire product.*

**Refer to wiring tag supplied with unit, for diagram and capacitor option.** For any DC unit - red lead goes to positive side of power source.

## **Plumbing**

To prevent air flow restriction, use pipe and fittings that are same size or larger than unit's threaded ports.

**NOTE:** Be sure to connect intake and exhaust plumbing to correct inlet and outlet ports.

## **Accessories**

Filters and mufflers are supplied on some models. Check periodically and replace when necessary. Consult a Gast Representative for filter recommendations. For best results, install relief valves and gauges at inlet or outlet, or both, to monitor performance.

## **Electric Motor Control**

Motor must be protected against short circuit, overload and excessive temperature rise. Fuses, motor-protective switches and thermal-protective switches provide necessary protection in these circumstances. Fuses only serve as a short circuit protection of motor (wiring fault). Fuses in the incoming line should be chosen so as to be able to withstand the starting current of the motor, not as a protection against overload.

Motor starters, incorporating thermal-magnetic overload or circuit breakers protect motor from overload or reduced voltage conditions.

Selection of correct overload setting is required to provide best possible protection. Refer to motor starter manufacturer's recommendations.

---

## **OPERATION**

**⚠ WARNING** Solid or liquid material exiting unit can cause eye or skin damage. Keep away from air stream.

**⚠ WARNING** Disconnect power before servicing to avoid electric shock or accidental start-up. The motor may be thermally protected and will restart automatically when it cools if the thermal protection switch is tripped.

**⚠ WARNING** Do not operate without grille(s), if provided, in place. Failure to do so could result in severe personal injury.

**⚠ WARNING** Head surface(s) can be very hot depending on unit duty and speed. Do not touch these parts during operation.

**⚠ CAUTION** Do not operate units above recommended pressures or vacuum duties. This will overheat unit.

## Starting

If unit is extremely cold let it warm up to room temperature before starting. If unit does not operate properly, see troubleshooting guide on page 7. Do not start against a vacuum or pressure load.

**NOTE:** Some of these models may exceed 70 dB(A).

When in close proximity to these models hearing protection is required. Refer to Technical Data Sheet for specific model.

---

## MAINTENANCE

### Filter Inspection and Replacement

Intake filter and mufflers require periodic inspection and replacement. Initial inspection is suggested at 500 hours, then user should determine frequency thereafter. Most problems can be prevented by keeping filters and mufflers clean. Dirty filters and mufflers decrease unit performance and can decrease unit life.

**⚠ WARNING** Do not touch unit cylinders and heads as they become very hot during operation and will burn skin on contact. Wait until unit has been turned off and allowed to cool before touching it.

**⚠ WARNING** Disconnect power before servicing to avoid electric shock.

Some filter element(s) are held together by a snap fit.

Refer to exploded view during the following procedure.

1. Turn off unit.
2. Isolate from power source.
3. Release all pressure and vacuum from unit.
4. Remove filter cover.
5. Inspect filter felt.
6. Replace felt if it is completely covered with contamination or has indicated an increase in differential pressure.
7. Assemble felt and filter cover.
8. Check for any damage to external accessories such as relief valves and gauges, before putting unit back into service.

---

## SHUTDOWN PROCEDURES

Proper shutdown procedures must be followed to prevent unit damage. Failure to do so may result in premature unit failure. Gast Manufacturing oil-less units are constructed of ferrous metals or aluminum which are subject to rust and corrosion when pumping condensable vapors such as water.

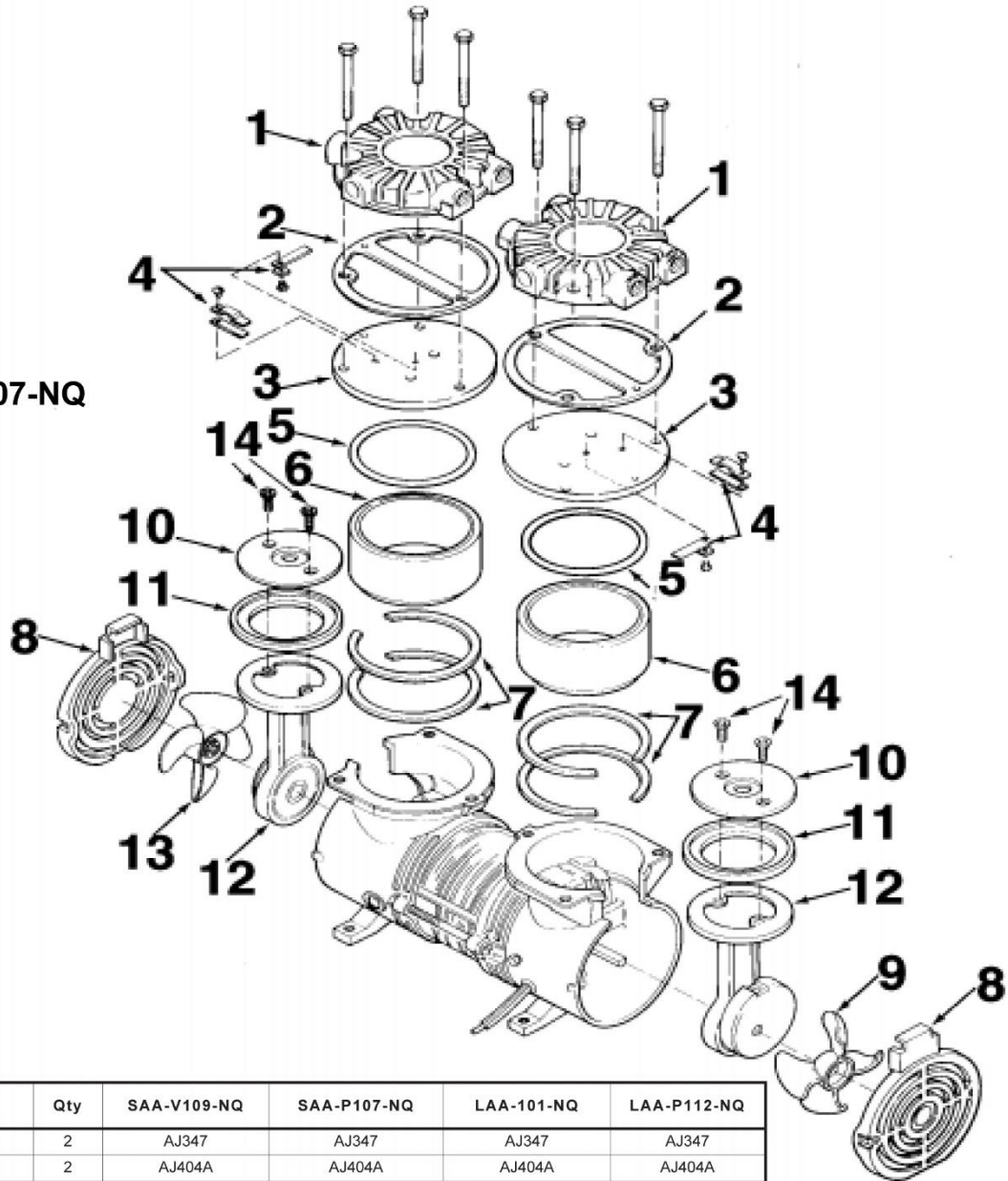
Follow steps below to assure correct storage and shutdown between use:

1. NEVER oil this oil-less unit.
2. After using this unit, disconnect plumbing and allow unit to run "open" for at least 5 minutes before shutdown.
3. Plug open ports to prevent dirt or other contaminants from entering unit.

It is now ready for shutdown or storage.

# SAA/LAA EXPLODED VIEW & PARTS ORDERING INFORMATION

## SAA-P107-NQ

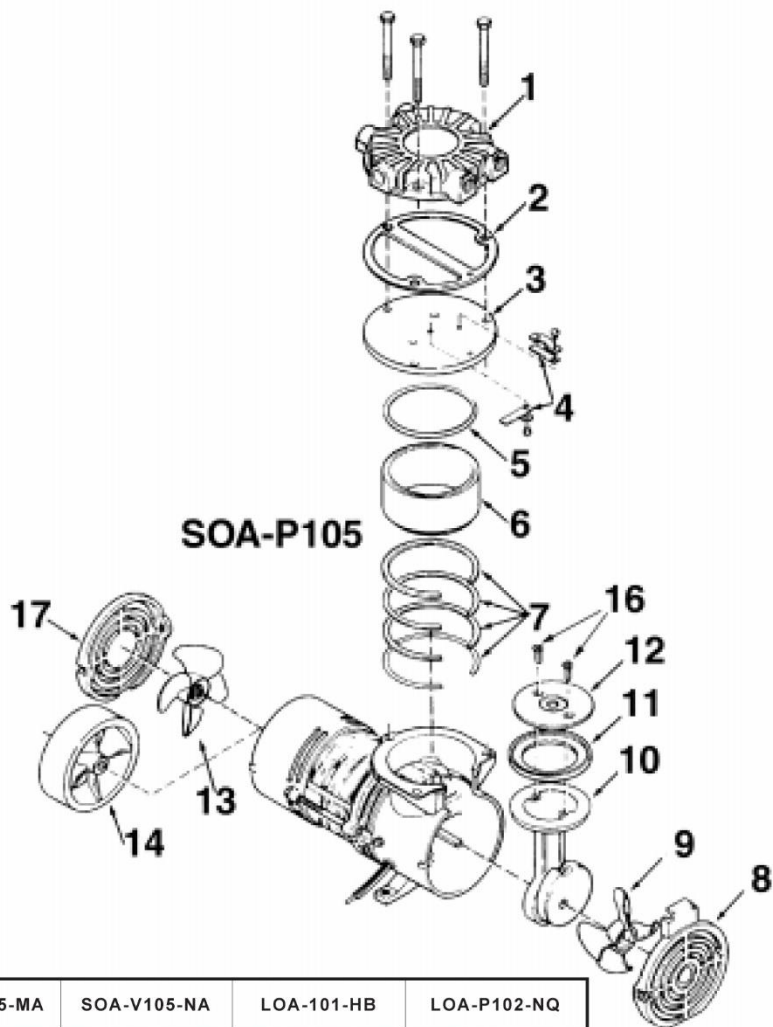


Ref No	Description	Qty	SAA-V109-NQ	SAA-P107-NQ	LAA-101-NQ	LAA-P112-NQ
1	Head	2	AJ347	AJ347	AJ347	AJ347
2	Head Gasket	2	AJ404A	AJ404A	AJ404A	AJ404A
3	Valve Plate Assembly ('valves included)	2	AJ343A	(1)AJ343 (1) AJ343A	(1)AJ793 (1) AK394	(1)AJ793 (1) AK394
4	Valves	4	AF817	AF817	(2) AG973 (2) AJ827	(2) AG973 (2) AJ827
5	O-ring	2	AH179	AH179	AH179	AH179
6	Cylinder	2	AJ342	AJ342	AJ375B	AJ375B
7	Shims	as req.	AJ345	AJ345	AJ345	AJ345
8	Grille	2	AG774B	AG774B	AG774B	AG774B
9	Fan	1	AJ856	AJ856	AJ856	AJ856
10	Retainer Plate	2	AH177B	AH177B	AK377	AK377
11	Cup	2	AH175	AH175	AJ826	AJ826
12	Connecting Rod	2	AJ338A	AJ308F	AK380D	AK380D
13	Fan	1	AF785B	AF785B	AF785B	AF785B
14	Retainer Plate Screws	4	BB557	BB557	BB557	BB557
	Service Kit	2	(2) K757	(1) K756 (1) K757	(1) K767 (1) K773	(1) K767 (1) K773

\*Denotes parts included in Service Kit. Parts listed are for stock models. For specific OEM models consult the factory.  
When corresponding or ordering parts, please give complete model and serial numbers.



## SOA/LOA EXPLODED VIEW & PARTS ORDERING INFORMATION



Ref No	Description	Qty	SOA-P105-MA	SOA-V105-NA	LOA-101-HB	LOA-P102-NQ
1	Head	1	AJ347	AJ347	AJ347	AJ347
2	Head Gasket	1	AJ404A	AJ404A	AJ404A	AJ404A
3	Valve Plate Assembly (valves included)	1	AJ343H	AJ343A	AJ793	AJ793
4	Valves*	2	AH693	AF817	(1) AG973 (1) AJ827	(1) AG973 (1) AJ827
5	O-ring	1	AH179	AH179	AJ787	AJ787
6	Cylinder	1	AJ342	AJ342	AJ375B	AJ375B
7	Shims	as req.	AJ345	AJ345	AJ345	AJ345
8	Front Grille	1	AG774B	AG774B	AG774B	AG774B
9	Fan	1	AJ856	AJ856	AJ856	AJ856
10	Connecting Rod Assembly	1	AJ308D	AJ338A	AK380B	AK380
11	Cup	1	AH175	AH175	AJ826	AJ826
12	Retainer Plate	1	AH177B	AH177B	AK377	AK377
13	Fan	1	AF785B	AF785B	AF785B	
14	Inertia Fan	1				AJ677
15	Tolerance Ring	1				AJ904
16	Retainer Plate Screws	2	BB557	BB557	BB557	BB557
17	Grille	1	AG744	AG744	AG744	
	Dowel Pin (Not Illustrated)	1				AK487
	Service Kit	1	K760	K757	K767	K767

\*Denotes parts included in Service Kit. Parts listed are for stock models. For specific OEM models consult the factory.  
When corresponding or ordering parts, please give complete model and serial numbers.



## SERVICE KIT INSTALLATION

**NOTE:** Gast will not guarantee performance of a field-rebuilt unit. Return unit to a Gast Authorized Service facility, or perform rebuild procedures described below.

Kits contain most or all of the following: Head Gasket, Valve Plate Assembly, Retainer Plate Screws, O-ring, and Cup.

Kits are used for several models and may contain extra parts not applicable for your specific model. Refer to exploded view.

### Disassembly:

1. Disconnect unit from power source.  
**⚠ WARNING** Disconnect power before servicing to avoid electric shock.
2. Vent all air lines to unit to remove pressure.  
**⚠ WARNING** Vent all air lines to unit to remove pressure before servicing it. Failure to do so can result in severe personal injury.
3. Remove head bolts.
4. Remove gasket, head, and valve plate assembly  
*(Note orientation of head assembly for re-assembly).*

5. Carefully remove cylinder and shims *(Be sure to replace all shims, as they are matched to cylinder and rod assembly height dimensions)*. Remove two retainer plate screws on retainer plate *(may require heat to break adhesive on retainer screws)* and discard old cup.
6. Clean residue from cylinder walls with soft cloth using non-petroleum, non-oil-based solvent. **DO NOT** use kerosene, gasoline, or any flammable substance.

### Re-assembly:

7. Replace cylinder and shims.
8. Place retainer plate in new cup and push both down into cylinder.
9. Install new retainer plate screws and torque to 35 in-lbs.
10. Install O-ring into groove of cylinder
11. Install valve plate, head gasket *(note gasket orientation)*, and head, on cylinder so ports are in original orientation.
12. Install and snug all head bolts and torque to 80 in-lbs.

**NOTE:** Before putting unit into service, ensure that any external accessories such as relief valves and gauges attached to head have not been damaged.

## TROUBLESHOOTING GUIDE

Possible Reason	Pressure		Low Vacuum	Excessive Noise	Overheating	Won't Start
	Low	High				
Dirty Filter	X				X	
Dirty Muffler			X		X	X
Dirty Valves	X		X			
Damaged Valves	X		X	X		X
Damaged/Worn Cup	X		X			
Improper Cylinder Shimming	X	X	X	X	X	X
Leaky Hose	X		X			
Leaky Check Valve						X
Plugged Vacuum or Pressure Line	X	X	X		X	X
Low Voltage	X		X		X	X
Leaky Relief Valve	X		X			

## **YOUR WARRANTY**

Gast finished products, when properly installed and operated under normal conditions of use, are warranted by Gast to be free from defects in material and workmanship for a period of twelve (12) months from the date of purchase from Gast or an authorized Gast Representative or Distributor. In order to obtain performance under this warranty, the buyer must promptly (in no event later than thirty (30) days after discovery of the defect) give written notice of the defect to Gast Manufacturing Incorporated, PO Box 97, Benton Harbor Michigan USA 49023-0097 or an authorized Service Center (unless specifically agreed upon in writing signed by both parties or specified in writing as part of a Gast OEM Quotation). Buyer is responsible for freight charges both to and from Gast in all cases.

This warranty does not apply to electric motors, electrical controls, and gasoline engines not supplied by Gast. Gast's warranties also do not extend to any goods or parts which have been subjected to misuse, lack of maintenance, neglect, damage by accident or transit damage.

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