

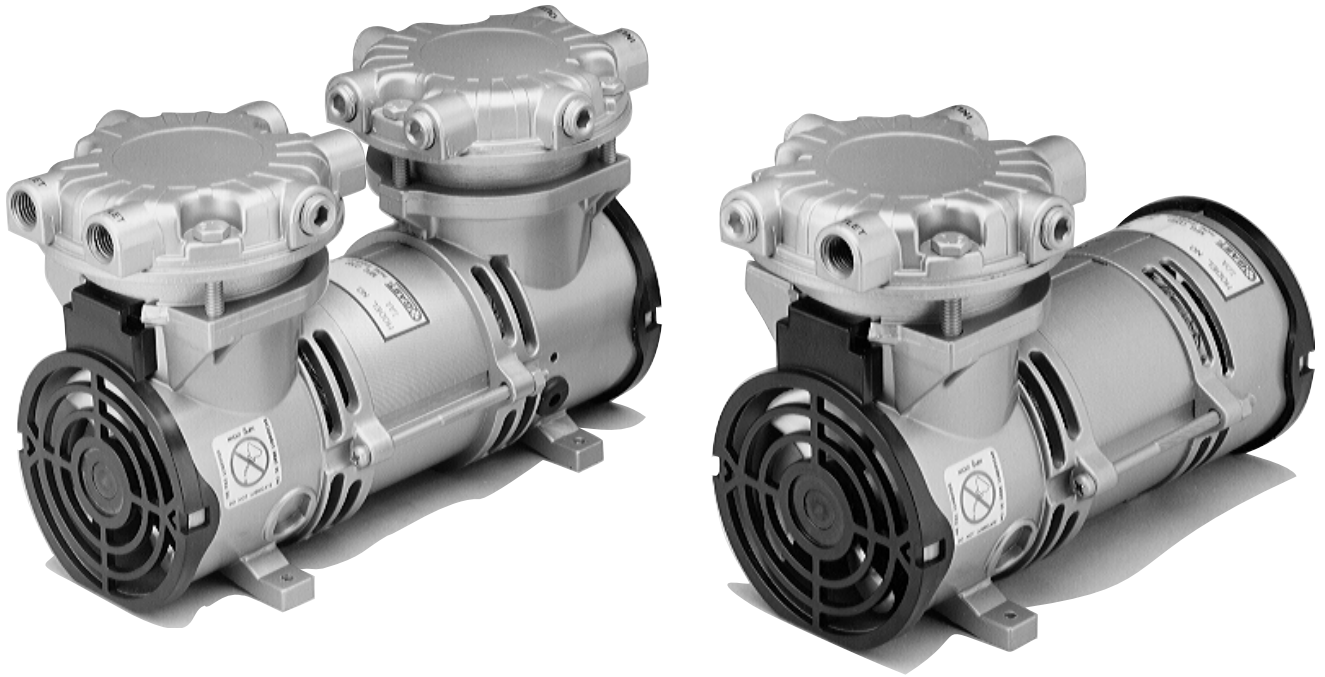
GAST

A UNIT OF IDEX CORPORATION



70-7050 G505PL (Rev. E)

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




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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

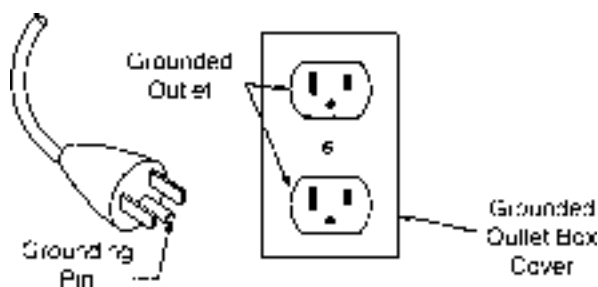


Figure 1

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.

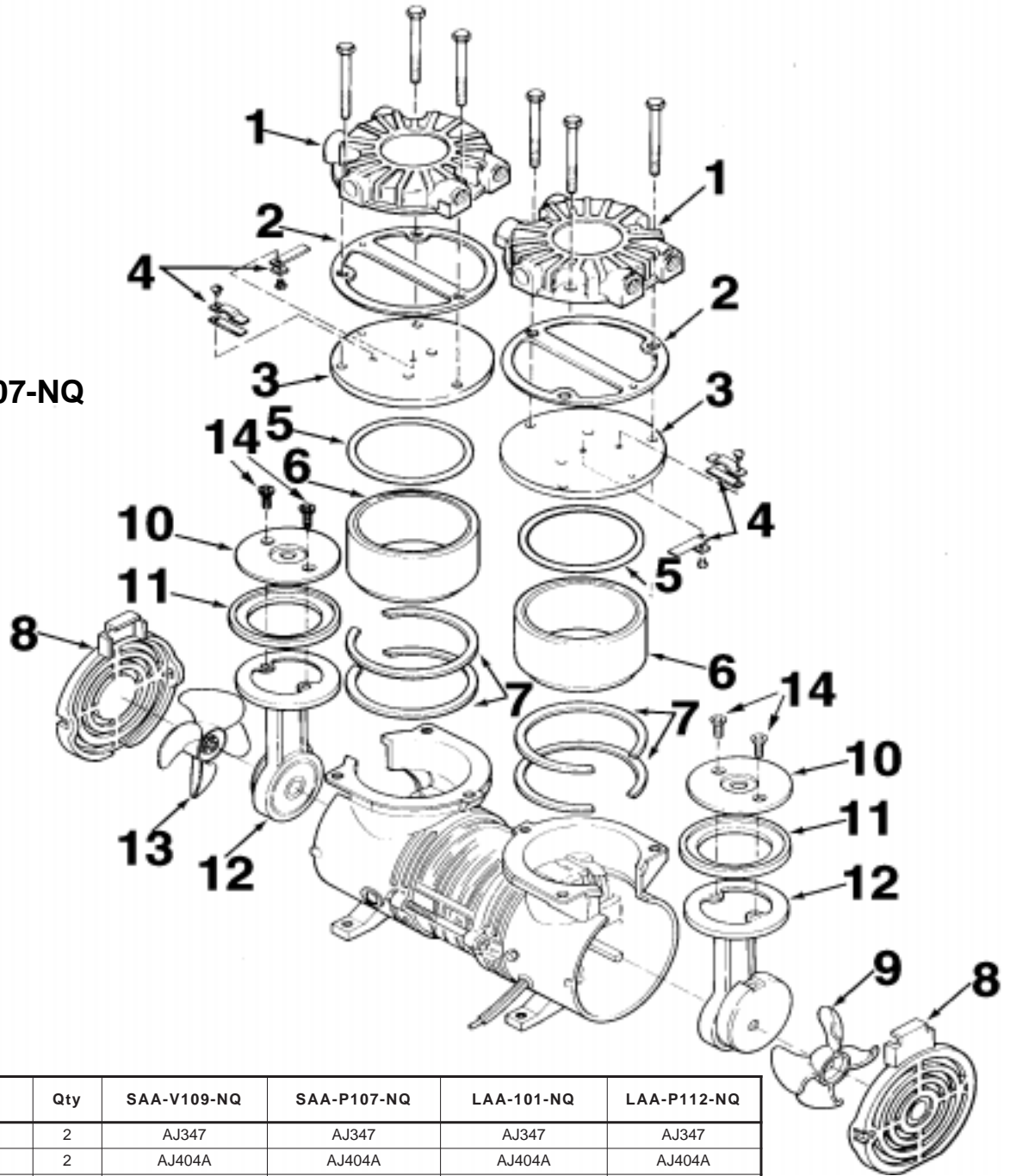
Follow steps below to assure correct storage and shutdown between use:

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

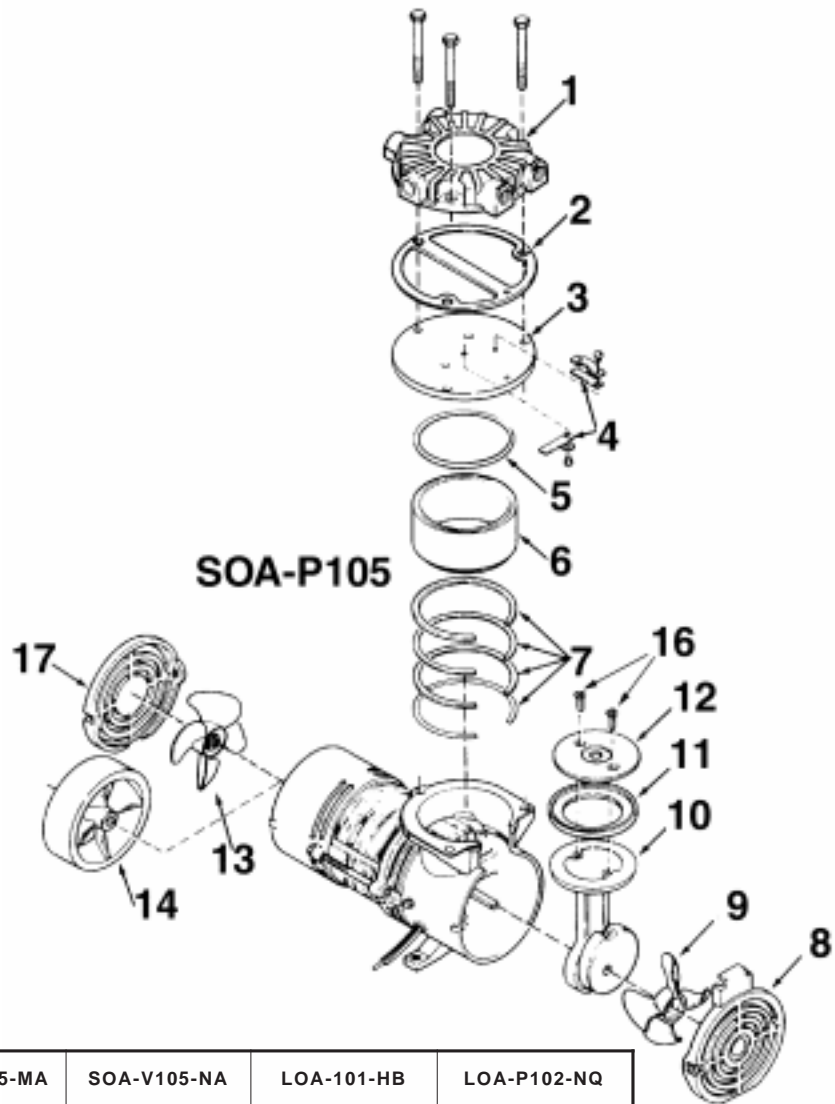
SAA-P107-NQ



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.

THIS EXPRESS WARRANTY EXCLUDES ALL OTHER WARRANTIES OR REPRESENTATIONS EXPRESSED OR IMPLIED BY ANY LITERATURE, DATA, OR PERSON. GAST'S MAXIMUM LIABILITY UNDER THIS EXCLUSIVE REMEDY SHALL NEVER EXCEED THE COST OF THE SUBJECT PRODUCT AND GAST RESERVES THE RIGHT, AT ITS SOLE DISCRETION, TO REFUND THE PURCHASE PRICE IN LIEU OF REPAIR OR REPLACEMENT.

GAST WILL NOT BE RESPONSIBLE OR LIABLE FOR INDIRECT OR CONSEQUENTIAL DAMAGES OF ANY KIND, however arising, including but not limited to those for use of any products, loss of time, inconvenience, lost profit, labor charges, or other incidental or consequential damages with respect to persons, business, or property, whether as a result of breach of warranty, negligence or otherwise. Notwithstanding any other provision of this warranty, BUYER'S REMEDY AGAINST GAST FOR GOODS SUPPLIED OR FOR NON-DELIVERED GOODS OR FAILURE TO FURNISH GOODS, WHETHER OR NOT BASED ON NEGLIGENCE, STRICT LIABILITY OR BREACH OF EXPRESS OR IMPLIED WARRANTY IS LIMITED SOLELY, AT GAST'S OPTION, TO REPLACEMENT OF OR CURE OF SUCH NONCONFORMING OR NON-DELIVERED GOODS OR RETURN OF THE PURCHASE PRICE FOR SUCH GOODS AND IN NO EVENT SHALL EXCEED THE PRICE OR CHARGE FOR SUCH GOODS. GAST EXPRESSLY DISCLAIMS ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE WITH RESPECT TO THE GOODS SOLD. THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTIONS SET FORTH IN THIS WARRANTY, notwithstanding any knowledge of Gast regarding the use or uses intended to be made of goods, proposed changes or additions to goods, or any assistance or suggestions that may have been made by Gast personnel.

Unauthorized extensions of warranties by the customer shall remain the customer's responsibility.

CUSTOMER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF GAST PRODUCTS FOR CUSTOMER'S USE OR RESALE, OR FOR INCORPORATING THEM INTO OBJECTS OR APPLICATIONS WHICH CUSTOMER DESIGNS, ASSEMBLES, CONSTRUCTS OR MANUFACTURES.

This warranty can be modified only by authorized Gast personnel by signing a specific, written description of any modifications.