

OIL-LESS PISTON VACUUM PUMP & COMPRESSOR

OPERATION & MAINTENANCE MANUAL



Model 1HAB-25 Shown

Thank you for purchasing this Gast product. It is manufactured to the highest standards using quality materials. Please follow all recommended maintenance, operational and safety instructions and you will receive years of trouble free service.

IMPORTANT: PLEASE READ THIS MANUAL AND SAVE FOR FUTURE REFERENCE.

Product Use Criteria:

- Pump only clean, dry air.
- Operate at 32°F - 104°F (0°C - 40°C).
- Protect unit from dirt & moisture.
- Do not pump flammable or explosive gases or use in an atmosphere that contains such gases.
- Protect all surrounding items from exhaust air. This exhaust air can become very hot.
- Corrosive gases and particulate material will damage unit. Water vapor, oil-based contaminants or other liquids must be filtered out.
- Consult your Gast Distributor/Representative before using at high altitudes.
- Oil-Less pump requires NO lubrication.
- Sealed bearings are grease packed and require NO lubrication.




ISO 9001 & 14001 CERTIFIED

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Your safety and the safety of others is extremely important.

We have provided many important safety messages in this manual and on your product. Always read and obey all safety messages.

 This is the safety alert symbol. This symbol alerts you to hazards that can kill or hurt you and others. The safety alert symbol and the words “DANGER” and “WARNING” will precede all safety messages. These words mean:

DANGER

You **will** be killed or seriously injured if you don't follow instructions.

WARNING

You **can** be killed or seriously injured if you don't follow instructions.

All safety messages will identify the hazard, tell you how to reduce the chance of injury, and tell you what can happen if the safety instructions are not followed.

INSTALLATION

WARNING



Electrical Shock Hazard

Disconnect electrical power at the circuit breaker or fuse box before installing this product.

Install this product where it will not come into contact with water or other liquids.

Install this product where it will be weather protected.

Electrically ground this product.

Failure to follow these instructions can result in death, fire or electrical shock.

Correct installation is your responsibility. Make sure you have the proper installation conditions and that installation clearances do not block air flow.

Blocking air flow over the product in any way can cause the product to overheat.

Mounting

This product can be installed in any orientation. Mounting the product to a stable, rigid operating surface and using shock mounts will reduce noise and vibration.

Plumbing

Remove plugs from the IN and OUT ports. Connect with pipe and fittings that are the same size or larger than the product's threaded ports. Be sure to connect the intake and exhaust plumbing to the correct inlet and outlet ports. Ports will not support plumbing.

Accessories

An intake filter and/or liquid trap is required for dirty environments. An intake filter is installed on the pump. Install the liquid trap between the line and the intake filter. Please consult your Gast Distributor/Representative for additional filter recommendations.

Install relief valves and gauges at inlet or outlet, or both, to monitor performance. Check valves may be required to prevent back streaming through the pump.

Motor Control

It is your responsibility to contact a qualified electrician and assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances. Grounding is required.

Determine the correct overload setting required to protect the motor (see motor starter manufacturer's recommendations). Select fuses, motor protective switches or thermal protective switches to provide protection. Fuses act as short circuit protection for the motor, not as protection against overload. Incoming line fuses must be able to withstand the motor's starting current. Motor starters with thermal magnetic overload or circuit breakers protect motor from overload or reduced voltage conditions.

The wiring diagram supplied with the product provides required electrical information. Check that power source is correct to properly operate the dual-voltage motors.

Electrical Connection

WARNING



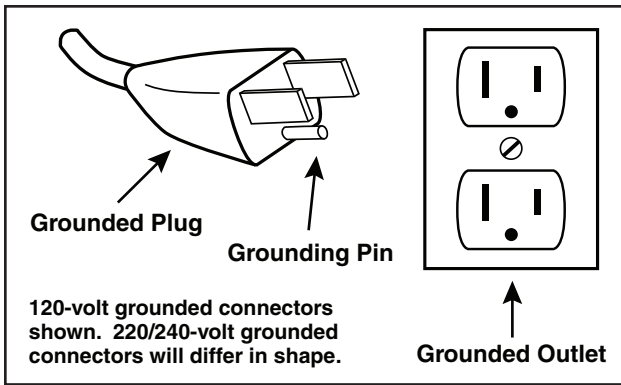
Electrical Shock Hazard

This product must be properly grounded.

Do not modify the plug provided. If it will not fit the outlet, have the proper outlet installed by a qualified electrician.

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 that is green with or without yellow stripes is the grounding wire.

Check the condition of the power supply wiring. Do not permanently connect this product to wiring that is not in good condition or is inadequate for the requirements of this product.



Model with a power supply cord:

This product must be grounded. For either 120-volt or 220/240-volt circuits connect power supply cord grounding plug to a matching grounded outlet. Do not use an adapter. (See above diagram.)

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 may be equipped with a power supply 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.

Check with a qualified electrician or serviceman if the grounding instructions are not completely understood, or if you are not sure 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.

Model that is permanently wired:

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

Power supply wiring must conform to all required safety codes and be installed by a qualified person. Check that supply voltage agrees with that listed on product nameplate.

Extension cords:

Use only a 3-wire extension cord that has a 3-blade grounding plug. Connect extension cord plug to a matching 3-slot receptacle. Do not use an adapter. Make sure your extension cord is in good condition. Check that the gage wire of the extension cord is the correct size wire to carry the current this product will draw.

An undersized cord is a potential fire hazard, and will cause a drop in line voltage resulting in loss of power causing the product to overheat. The following table indicates the correct size cord for length required and the ampere rating listed on the product nameplate. **If in doubt, use the next heavier gage cord. The smaller the gage number, the heavier the wire gage.**

Minimum gage for extension cords

Amps	Volts	Length of cord in feet								
		25	50	100	150	200	250	300	400	500
	120v	25	50	100	150	200	250	300	400	500
	240v	50	100	200	300	400	500	600	800	1000
0-2		18	18	18	16	16	14	14	12	12
2-3		18	18	16	14	14	12	12	10	10
3-4		18	18	16	14	12	12	10	10	8
4-5		18	18	14	12	12	10	10	8	8
5-6		18	16	14	12	10	10	8	8	8
6-8		18	16	12	10	10	8	6	6	6
8-10		18	14	12	10	8	8	6	6	4
10-12		16	14	10	8	8	6	6	4	4
12-14		16	12	10	8	6	6	6	4	2
14-16		16	12	10	8	6	6	4	4	2
16-18		14	12	8	8	6	4	4	2	2
18-20		14	12	8	6	6	4	4	2	2

OPERATION



Injury Hazard

Install proper safety guards as needed.

Keep fingers and objects away from openings and rotating parts.

When provided, motor terminal covers must be in place for safe operation.

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Wear hearing protection. Sound level from motor may exceed 70 dBA.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to operate this product at recommended pressures or vacuum duties and room ambient temperatures. This pump is designed to operate up to 25 in. Hg vacuum or 100 PSIG pressure.

Start Up

Increase pressure: Check the pressure gauge for output pressure. Turn the regulator screw in to increase pressure. Maximum pressure is approximately 100 PSI.

Increase vacuum: Check the vacuum gauge for input vacuum. Turn the regulator screw in to increase vacuum. Maximum vacuum is approximately 25 in. Hg.

Maximum pressure and vacuum cannot be produced at the same time.

If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. If the thermal protection switch has tripped, the motor can restart after cooling. Check that the voltage is correct for motor and that motor is turning in the proper direction. Check the plug, cord and switch for damage.

MAINTENANCE

WARNING



Electrical Shock Hazard

Disconnect electrical power supply cord before performing maintenance on this product.

If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before performing maintenance on this product.

Failure to follow these instructions can result in death, fire or electrical shock.

WARNING

Injury Hazard

Product surfaces become very hot during operation, allow product surfaces to cool before handling.

Air stream from product may contain solid or liquid material that can result in eye or skin damage, wear proper eye protection.

Clean this product in a well ventilated area.

Failure to follow these instructions can result in burns, eye injury or other serious injury.

It is your responsibility to:

- **Regularly inspect and make necessary repairs to product in order to maintain proper operation.**
- **Make sure that pressure and vacuum is released from product before starting maintenance.**

Check intake and exhaust filters after first 500 hours of operation. Clean filters and determine how frequently filters should be checked during future operation. This one procedure will help to assure the product's performance and service life.

Solvent Cleaning

Use only Gast AH255B Solvent or other non-petroleum based solvent. Do Not use kerosene or ANY other combustibile solvent to flush product.

1. Remove filters and clean with Gast AH255B solvent or other non-petroleum based solvent. Use compressed air to dry filters and make sure that all moisture is removed. Reinstall filters.

Check that all external accessories such as relief valves and gauges are attached to cover and are not damaged before re-operating product.

SHUTDOWN PROCEDURES

It is your responsibility to follow proper shutdown procedures to prevent product damage. NEVER ADD OIL TO THIS OIL-LESS PUMP.

Proper shutdown procedures must be followed to prevent pump damage. Failure to do so may result in premature pump failure. Gast Manufacturing Oil-Less Piston Vacuum Pumps and Compressors are constructed of ferrous metals or aluminum which are subject to rust and corrosion when pumping condensable vapors such as water. Follow the steps below to assure correct storage and shutdown between operating periods.

1. Disconnect plumbing.
2. Operate product for at least five minutes without plumbing.
3. Run at maximum vacuum for 10 to 15 minutes.
4. Repeat step 2.
5. Disconnect power supply.
6. Plug open ports to prevent dirt or other contaminants from entering product.

SERVICE KIT INSTALLATION

WARNING



Electrical Shock Hazard

Disconnect electrical power supply cord before installing Service Kit.

If product is hard wired into system, disconnect electrical power at the circuit breaker or fuse box before installing Service Kit.

Vent all air lines to release pressure or vacuum.

Failure to follow these instructions can result in death, fire or electrical shock.

Gast will NOT guarantee field-rebuilt product performance. For performance guarantee, the product must be returned to a Gast Authorized Service Facility.

Service Kit contents vary. Most contain head and cylinder gaskets, inlet and outlet valves, piston rings and seals and a rider ring.

1. Disconnect electrical power to pump.
2. Disconnect air supply and vent all air lines to release pressure or vacuum.
3. Remove the four Phillips-head screws in the shroud. Remove the shroud.
4. Mark the position of the cylinder head to make reinstalling easier.
5. Remove the four cap screws and washers from the corners of the cylinder head. Remove the head.
6. Assemble the new gaskets, valves and valve plate in the same order as the existing parts.
7. Remove the two cap screws and washers from the cylinder. Remove the cylinder.
8. Remove the old piston seals, piston rings and piston rider ring and discard.
9. Clean the cylinder head, valve plate and cylinder with Gast AH255B solvent or other non-petroleum based solvent.

Do not scratch or damage valve seal areas, gasket seal areas or cylinder bore.

10. Inspect cylinder bore. If scoring has occurred, send pump to a Gast Authorized Service Facility.
11. Install new piston seals, piston rings and piston rider ring on the piston. The seal ring, joints should be located opposite each other.
12. Slide the cylinder over the piston rings. Install the two cylinder cap screws and washers and finger tighten.
13. Rotate the pump so that the piston is at top and center. Adjust the top of the cylinder so it is flush with the top of the piston. Torque the cap screws to 150-160 in. lbs. Torque the bolts a second time.
14. Use the four cap screws and washers to install the cylinder head, gaskets, valves and valve plate. (The exhaust ports have a flat area on the center cooling fins). Torque the cap screws to 110-120 in. lbs.
15. Operate the pump for approximately 10 minutes. Torque the bolts a second time.

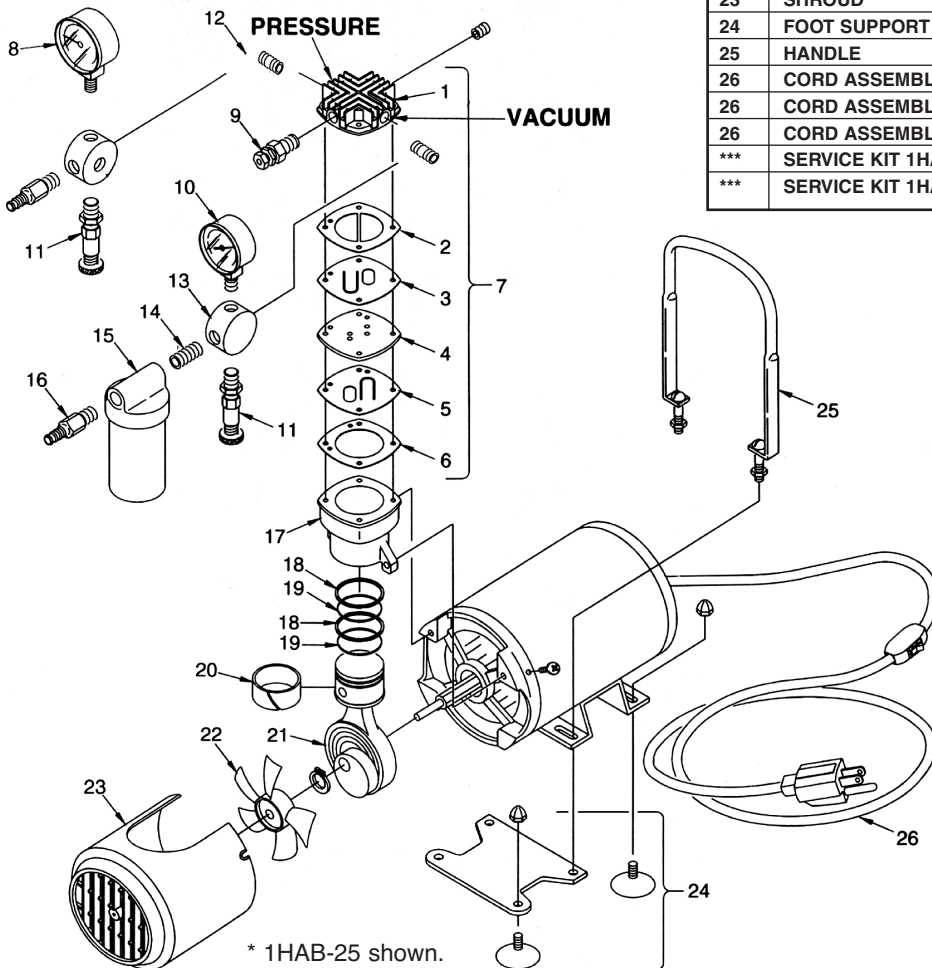
Check that all external accessories such as relief valves and gauges are attached to cover and are not damaged before re-operating product.

If pump still does not produce proper vacuum or pressure, send unit to a Gast Authorized Service Facility for repair.

EXPLODED PRODUCT VIEW, PARTS & ORDERING INFORMATION

1HAB / 1HAE SERIES

REF	DESCRIPTION	QTY	1HAB 1HAE
1	HEAD	1	AF508
2 Ø	HEAD GASKET	1	AF518
3 Ø	VALVE, OUTLET	1	AF531
4	VALVE PLATE	1	AF529
5 Ø	VALVE, INLET	1	AF530
6 Ø	GASKET, CYLINDER	1	AF519A
7	HEAD ASSEMBLY (Includes 1-6 above)	1	AG449
8	PRESSURE GAUGE	1	AF583
9	PRESSURE REGULATOR	1	AF592S
10	VACUUM GAUGE	1	AA640
11	REGULATOR	1	AA986B
12	NIPPLE	2	BA707
13	MANIFOLD	2	AF335
14	NIPPLE	1	BA711
15	FILTER/MUFFLER	1	AA617G
16	HOSE NIPPLE	2	AA254D
17	CYLINDER	1	AF510
18 Ø	PISTON SEAL	2	AF526
19 Ø	PISTON RING	2	AF527
20 Ø	RIDER RING	1	AF594
21	PISTON ROD 1HAB-25, 1HAB-25B	1	AF560B
21	PISTON ROD 1HAE-25, 1HAE-25A	1	AF560E
22	FAN	1	AF533
23	SHROUD	1	AF534
24	FOOT SUPPORT ASSEMBLY	1	AE245
25	HANDLE	1	AF554
26	CORD ASSEMBLY 1HAB-25, 1HAB-25B	1	AA896
26	CORD ASSEMBLY 1HAE-25	1	AL239
26	CORD ASSEMBLY 1HAE-25A	1	AA819
***	SERVICE KIT 1HAB-25, 1HAE-25	1	K264C
***	SERVICE KIT 1HAB-25B, 1HAE-25A	1	K264C



* 1HAB-25 shown.

*** Item not shown.

Δ Denotes parts included in the Service Kit.

Δ The service kit may contain parts for more than one model or style piston pump.

Parts not needed may be discarded.

Parts listed are for stock models. For specific OEM models, please consult the factory.

When corresponding or ordering parts, please give complete model and serial numbers.

TROUBLESHOOTING CHART

Low		High		Pump Overheat	Motor Overload	Excess Noise	Reason and remedy for problem.
Vacuum	Pressure	Vacuum	Pressure				
•	•	At Pump		•	•		Filter dirty. Clean or replace.
•	•		At pump	•	•		Muffler dirty. Clean or replace.
•	•						Valves dirty or valves bent. Clean or replace.
•	•						Worn piston rings. Repair or replace.
			•	•	•		Relief valve set too high. Inspect and adjust.
•	•						Relief valve set too low. Inspect and adjust.
•	•	At pump	At pump	•	•		Plugged vacuum/pressure line. Inspect and repair.
•		At pump					Collapsed vacuum line. Inspect and repair.
				•	•		Low voltage, won't start. Check power source.
				•	•	•	Voltage wrong. Check power source.
•	•					•	Worn rings/piston hitting cylinder. Replace.
				•		•	Cylinder misadjustment. Realign.
•	•						Leaky hose or check valve. Replace.
•	•			•	•	•	Dirt or liquid on top of piston. Inspect and clean.
•	•			•	•		Motor not wired correctly. Check wiring diagram/line voltage.
•	•					•	Blown head gasket. Replace.

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