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TECHNOLOGY GROUP

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71R & 72R SERIES
ROCKING PISTON OIL-LESS PUMPS

OPERATION & MAINTENANCE MANUAL



Single Cylinder Model Shown



Twin Cylinder Model 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.

⚠ WARNING



PLEASE READ THIS MANUAL COMPLETELY BEFORE INSTALLING AND USING THIS PRODUCT. SAVE THIS MANUAL FOR FUTURE REFERENCE AND KEEP IN THE VICINITY OF THE PRODUCT.

Product Use Criteria:

- Pump only clean, dry air.
- Operate at 32ºF - 104ºF (0ºC - 40ºC).
- 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.
- This pump is oil-less and requires NO lubrication.

GAST
A Unit of IDEX Corporation

ISO 9001 & 14001 CERTIFIED **www.gastmfg.com**

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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.

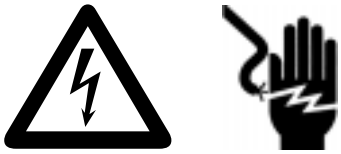
WARNING

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
The product's external intake and exhaust muffler will provide adequate filtration in most applications. Check filters periodically and replace when necessary. 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.

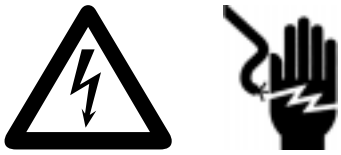
Motor Control
It is your responsibility to contact a qualified electrician and assure that the electrical installation is adequate and in conformance with all national and local codes and ordinances. The metal capacitor must be grounded.

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

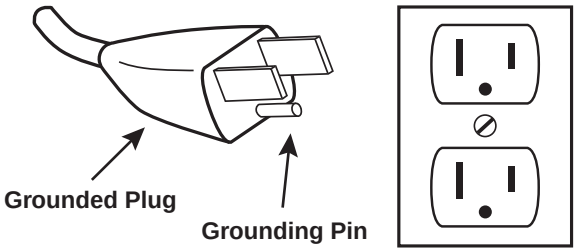
This product must be properly grounded.

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 or green with 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.

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



120-volt grounded connectors shown. 220/240-volt grounded connectors will differ in shape.

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								
	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

WARNING

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. Do not start against a vacuum or pressure load.

Start Up
If motor fails to start or slows down significantly under load, shut off and disconnect from power supply. 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. If so equipped, the thermal protection switch has tripped, the motor can restart after cooling.

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 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.

1. Remove filter cover.
2. Remove filters and felt (some filters are held together with a snap fitting). Clean filters by washing in a non-petroleum based solvent or soap and water. After cleaning, dry with compressed air to make sure all moisture is removed before reinstalling filters.
3. Reinstall felt and filters.
4. Reinstall cover.

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

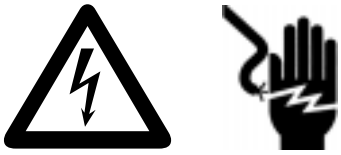
It is your responsibility to follow proper shutdown procedures to prevent product damage.
NEVER ADD OIL TO THIS OIL-LESS PUMP.

Proper shutdown procedures must be followed to prevent pump damage. Failure to do so may result in premature pump failure. Gast Manufacturing Rocking Piston Oil-Less Pumps 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 5 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 gasket and filter parts.

1. Disconnect electrical power to pump.
2. Disconnect air supply and vent all air lines to release pressure or vacuum.
3. Mark the orientation of the ports so cover will be reinstalled correctly.
4. Remove screws from the head of the pump. Remove the head of the pump.
5. Mark orientation of valve plate(s). Remove valve plate(s).
6. Remove and discard old cups(s), retainer screws, cylinder O-ring(s), head O-ring(s), valves and valve retainers.
7. Install new cup(s) on rod(s) facing up.
8. Reinstall retainer plates.
9. Apply a thread locking compound (Loctite 222) to retainer screws. Torque screws to 34-38 in. lbs.
10. Carefully install cylinder(s) over cup(s) at an angle to avoid damaging cup(s).
11. Clean valve plates with water based solvent. Take care to not scratch valve seats.
12. Install valves and valve retainers. Check that the orientation with the ports is correct.
13. Apply a thread locking compound (Loctite 222) to retainer screws. Torque screws to 10-13 in. lbs.
14. Install cylinder O-ring(s) in the bottom of valve plate(s).
15. Check that the orientation of valve plate(s) with the ports is correct.
16. Install head O-rings in the O-ring grooves on top of valve plate.
17. Reinstall head over valve plate(s) checking that orientation with ports is correct.
18. Torque screws to 50 in. lbs.

Check that all external accessories such as relief valves and gauges 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.

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.

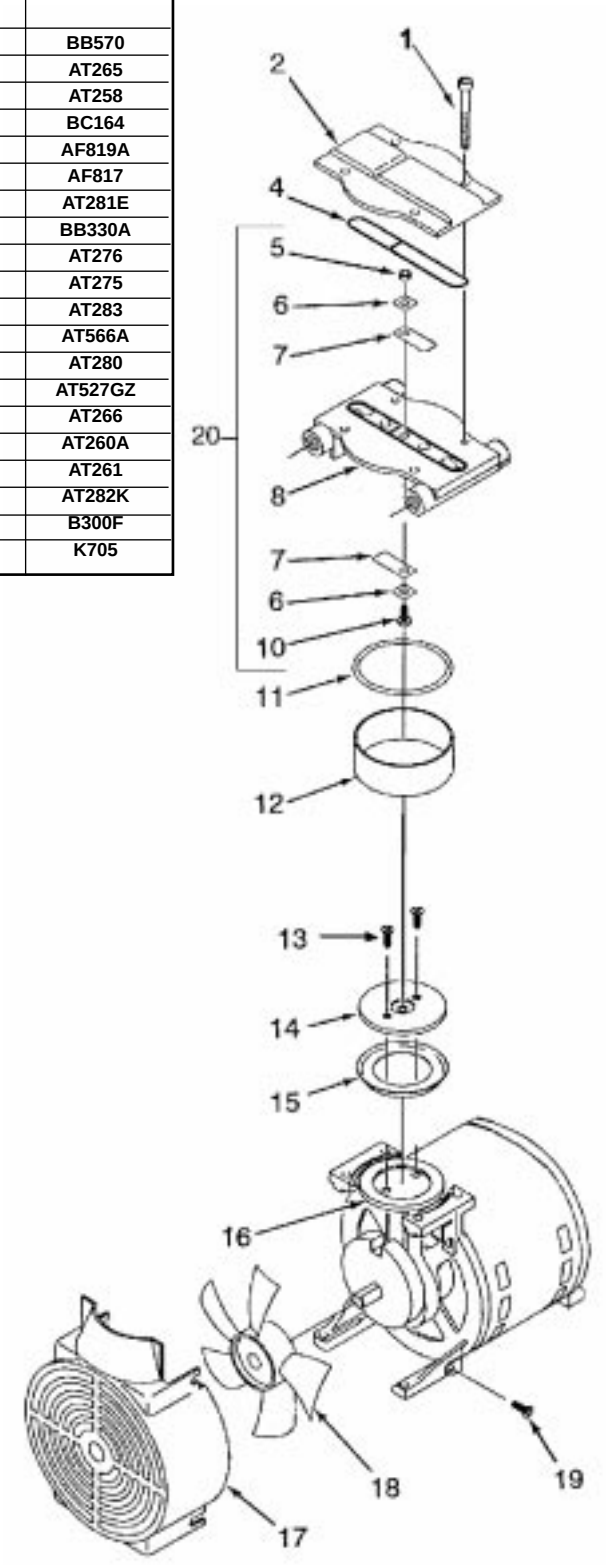
Unauthorized extensions of warranties by the customer shall remain the customer's responsibility.

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.

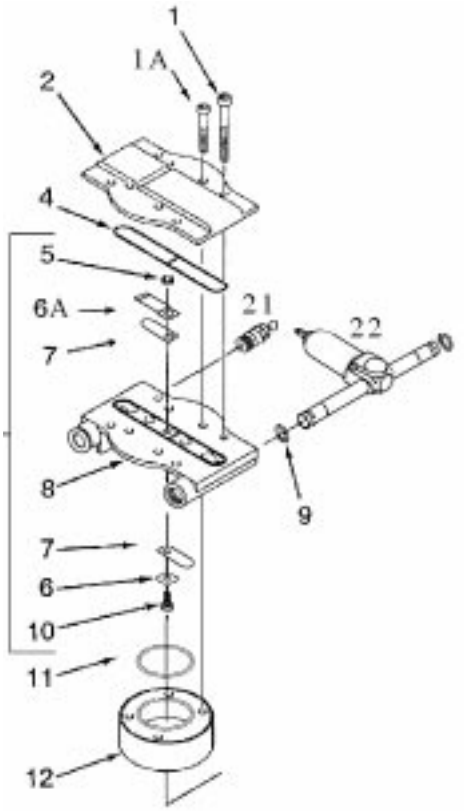
EXPLODED PRODUCT VIEW, PARTS & ORDERING INFORMATION

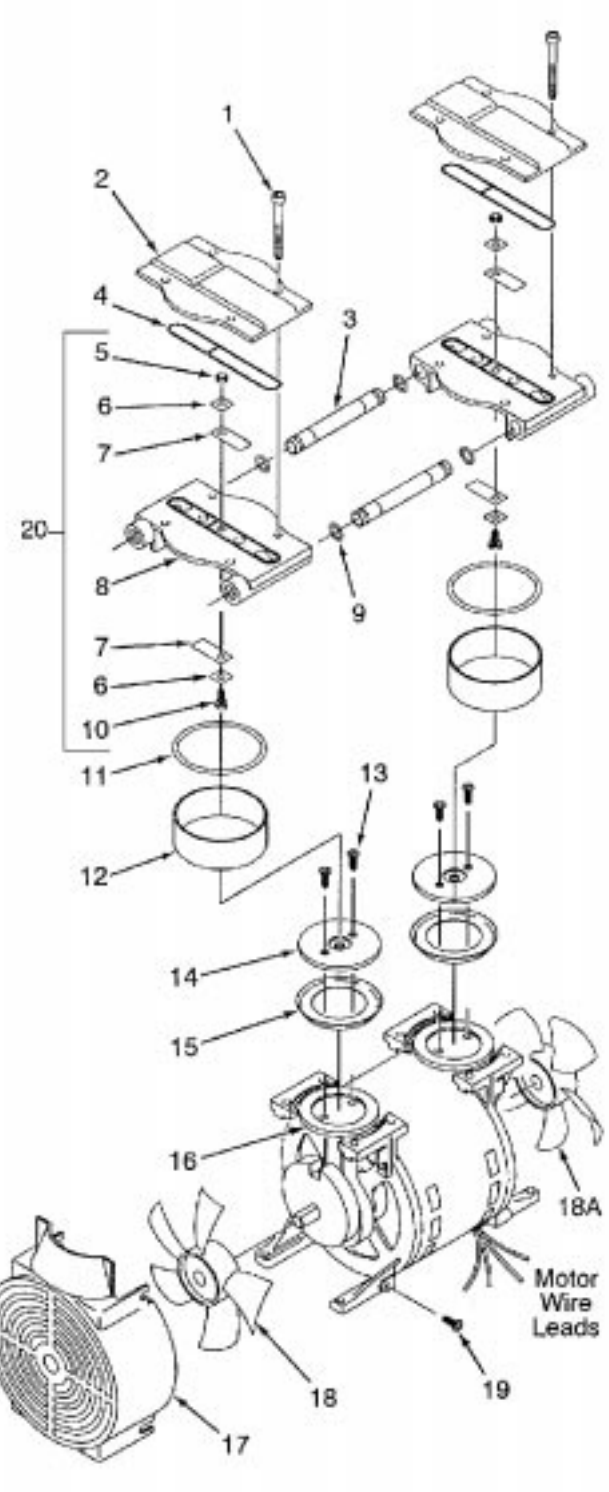
REF	DESCRIPTION	QTY	71R135-P001B	71R142-P001B	72R142-P001B
1	CAP SCREWS	4	BB570	BB570	BB570
2	HEAD	1	AT265G	AT265G	AT265
4 Δ	HEAD O-RING	1	AT258	AT258	AT258
5	HEX NUT	1	BC164	BC164	BC164
6 Δ	VALVE RETAINER	2	AF819A	AF819A	AF819A
7 Δ	LEAF VALVE	2	AF817	AF817	AF817
8	VALVE PLATE	1	AT631E	AT631E	AT281E
10	VALVE SCREW	1	BB330B	BB330B	BB330A
11 Δ	CYLINDER O-RING	1	AT256	AT256	AT276
12 Δ	CYLINDER	1	AT272	AT272	AT275
13 Δ	RETAINER SCREW	2	AT283	AT283	AT283
14	RETAINER PLATE	1	AT715	AT715	AT566A
15 Δ	PISTON CUP	1	AT329	AT329	AT280
16	ROD ASSEMBLY	1	AT526KZ	AT526GZ	AT527GZ
17	SHROUD	1	AT266	AT266	AT266
18	FAN	1	AT260A	AT260A	AT260A
19	SHROUD SCREW	4	AT261	AT261	AT261
20	VALVE PLATE ASSEMBLY	1	AT633K	AT633K	AT282K
***	FILTER	1	B300F	B300F	B300F
***	SERVICE KIT	1	K704	K704	K705



*** Item not shown.
Δ Denotes parts included in the Service Kit.
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.

(FIG 1)
FOR MODELS 71R545-P315B
COVER/VALVE PLATE ASSM. SHOWN
SEPARATELY TO SHOW HIGH
PRESSURE END OF UNIT





EXPLODED PRODUCT VIEW, PARTS & ORDERING INFORMATION

REF	DESCRIPTION	QTY	71R645-P112 71R645-V114	71R655-P112 71R655-V114	72R645-P112 72R645-V114	72R655-P112 72R655-V114	71R545-P315B
1	CAP SCREWS	8	BB570	BB570	BB570	BB570	(4) BB570
1A	CAP SCREWS	4					(4) BB614B
2	HEAD	2	AT265G	AT265G	AT265G	AT265G	(1) AT265G (1) AT265H
4 Δ	HEAD O-RING	2	AT258	AT258	AT258	AT258	AT258
5	HEX NUT	2	BC164	BC164	BC164	BC164	BC164
6 Δ	VALVE RETAINER	2	AF819A	AF819A	AF819A	AF819A	(3) AF819A
6A	VALVE LIMITER	1					(1) AH406
7 Δ	LEAF VALVE	2	AF817	AF817	AF817	AF817	(2) AF817 (2) AJ827A
8	VALVE PLATE	1	AT631	AT631	AT632	AT632	(1) AT631C (1) AT632X
9 Δ	TUBE O-RING	4	AK846	AK846	AK846	AK846	(2) AT528
10	VALVE SCREW	2	BB330	BB330	BB330	BB330	BB330B
11 Δ	CYLINDER O-RING	1	AT256	AT256	AT276	AT276	(1) AT256 (1) AJ787
12 Δ	CYLINDER	2	AT272	AT272	AT275	AT275	(1) AT272 (1) AT291
13 Δ	RETAINER SCREW	4	BB557	BB557	AT283	AT283	(2) AT283 (2) BB557
14	RETAINER PLATE	2	AT273	AT273	AT274C	AT274C	(1) AT715 (1) AT443A
15 Δ	PISTON CUP	2	AT329	AT329	AT280	AT280	(1) AT329 (1) AT299A
16	ROD ASSEMBLY (pressure models) ROD ASSEMBLY (vacuum models)	2 2	AT465FZ AT466FVZ	AT547BZ AT560BVZ	AT467FZ AT469FVZ	AT584BZ AT493BVZ	(1) AT453FZ (1) AT459QZ
17	SHROUD	2	AT266	AT266	AT266	AT266	AT266
18	FAN	1	AT260A	AT260A	AT260A	AT260A	AT260A
18A	FAN-LEAD END	1	AT259A	AT259A	AT259A	AT259A	AT259A
19	SHROUD SCREW	8	AT261	AT261	AT261	AT261	AT261
20	VALVE PLATE ASSEMBLY	1 1	AT633 AT633A	AT633 AT633A	AT634 AT634A	AT634 AT634A	AT633G AT634X
21	RELIEF VALVE	1					AT471
22	FILTER	1					AT441
***	RUBBER FEET	4	AB319	AB319	AB319	AB319	AB319
***	SERVICE KIT	1	K557	K557	K558	K558	K634

*** Item not shown.
Δ Denotes parts included in the Service Kit.
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	Won't	Excess	Reason and remedy
Vacuum	Pressure	Vacuum	Pressure	Overheat	Start	Noise	for problem.
•	•	•		•	•		Filter dirty. Clean or replace.
•	•		•	•	•		Muffler dirty. Clean or replace.
•	•						Valves dirty or valves bent. Clean or replace.
•	•						Worn cup. Repair or replace.
			•	•	•		Relief valve set too high. Inspect and adjust.
•	•						Relief valve set too low. Inspect and adjust.
•	•	•	•	•	•		Plugged vacuum/pressure line. Inspect and repair.
•		•					Collapsed vacuum line. Inspect and repair.
				•	•		Low voltage, won't start. Check power source.
				•	•	•	Voltage wrong. Check power source.
•	•					•	Worn cup/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.

MAINTENANCE RECORD

DATE	PROCEDURE PERFORMED

For repair parts ordering information and exploded product view, visit our website or call us at the number listed below.

We have Gast Authorized Repair Facilities throughout the world. For the most up-to-date listing, contact one of our sales offices below:

World Headquarters
P.O. Box 97
2550 Meadowbrook Rd.
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Fax: (852) 2690 1012
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