



A Gorman-Rupp Company

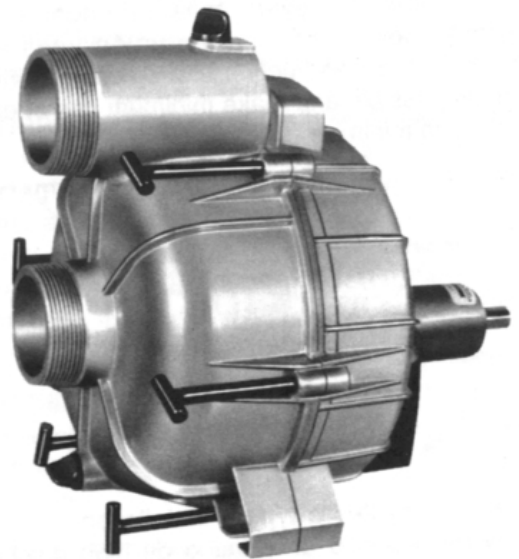
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# Owner's Manual

Models: 2S5P & 3S5P

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## OPERATION AND MAINTENANCE OF SELF-PRIMING CENTRIFUGAL TRASH PUMPS PEDESTAL DRIVE



# || **WARNING!!** DO NOT USE PUMP IN EXPLOSIVE ATMOSPHERE DO NOT PUMP VOLATILE OR FLAMMABLE LIQUIDS ||

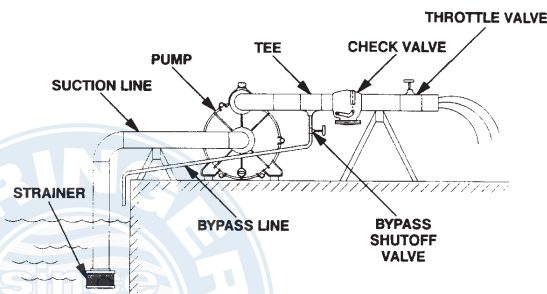
## Installation & Operating Instructions Self-Priming Centrifugal Pump

### BASIC PUMP INSTRUCTIONS

**INSPECTION:** The pump assembly was tested and inspected before shipment. Before installation, inspect the pump for damage which may have occurred during shipment. Check the following: **1.** Inspect for cracks, damaged threads, and other obvious damage. **2.** Check and tighten loose bolts, nuts and other attaching hardware. **3.** Carefully read all warning and cautions in the manual and on tags and labels on the pump. **4.** Note the direction of rotation indicated on the pump. Check that the pump shaft rotates counterclockwise facing the pump suction. **CAUTION:** Only operate this pump in the direction indicated by the arrow on the bearing pedestal. Otherwise, the impeller could become loosened from the shaft and seriously damage the pump.

**PLACING PUMP:** Locate the pump as close to the liquid to be pumped as practical, but never higher than 25 feet. Level mounting is essential for proper operation. The pump may have to be supported to provide level operation and to eliminate vibration.

**SUCTION AND DISCHARGE PIPING:** Either pipe or hose may be used for suction and discharge lines. If hose is used in suction lines, it must be the rigid-wall, reinforced type to prevent collapse under suction. Using pipe couplings in the suction lines is not recommended. Keep suction and discharge lines as straight as possible and make minimum use of elbows and fittings to minimize friction losses.



**FIGURE 1** illustrates a typical installation. A bypass line may be required for priming on high discharge head applications.

**CONNECTIONS TO PUMP:** Before tightening a connection pipe, align it exactly with the pump port. Never pull a pipe line into place by tightening the flange bolts and/or couplings. Lines near the pump must be independently supported to avoid strain on

the pump. If hoses are used, they should have adequate support to secure them when filled with liquid.

**SUCTION LINES:** The suction line must be as short and direct as possible and the line must always slope upward to the pump from the source of the liquid. The suction line should **not** exceed 30 feet in length. Suction lines should be the same size as the pump inlet. Use pipe sealant on the threads of the fittings.

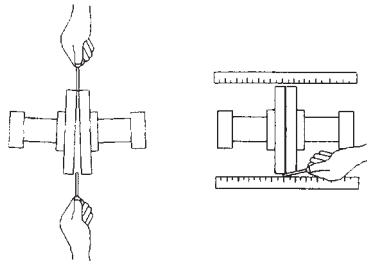
**STRAINERS:** A strainer is furnished with the pump, be certain to use it. It is provided with openings small enough to prevent big stones, etc. from damaging the impeller. Keep strainer clean. If possible, suspend it to keep it from working into sediment.

**VALVES:** A check valve in the discharge line is normally recommended, but it is not necessary in low discharge head applications. If a throttling valve is desired in the discharge line, use a valve as large as the largest pipe to minimize friction losses. With high discharge heads, it is recommended that a throttling valve and a check valve be installed in the discharge line to protect the pump from excessive shock pressure and reverse rotation when it is stopped.

**BYPASS LINES:** If it is necessary to permit the escape of air to atmosphere during initial priming or in the repriming cycle, install a bypass line between the pump and the discharge check valve. The bypass line should be sized so that it does not affect pump discharge capacity.

**ALIGNMENT:** The alignment of the pump and its power source is critical for trouble-free mechanical operation. The driver and pump must be mounted on a common base so that their shafts are aligned with and parallel to each other. It is imperative that alignment be checked after the pump and piping are installed, and before operation. **WARNING:** When checking alignment, disconnect the power source to ensure that the pump will remain inoperative.

**COUPLED DRIVES:** When using couplings, the axis of the power source must be aligned to the axis of the pump shaft in both the horizontal and vertical planes. Most couplings require a specific gap or clearance between the driving and the driven shafts. Refer to the coupling manufacturer's service literature. The coupling is in alignment when the hub ends are the same distance apart at all points. (See Figure 2)



**FIGURE 2** Aligning Couplings

Check parallel adjustment by laying a straightedge across both coupling rims at the top, bottom, and side. When the straightedge rests evenly on both halves of the coupling, the coupling is in horizontal parallel alignment. If the coupling is misaligned, use a feeler gauge between the coupling and the straightedge to measure the amount of misalignment.

**V-BELT DRIVES:** V-Belt drives are not recommended.

**WARNING:** Do not operate the pump without a guard over the rotating parts. Exposed rotating parts can catch clothing, fingers, or tools, causing severe injury to personnel.

**PUMP BEARING PEDESTAL:** The shaft bearings are permanently lubricated by the manufacturer and sealed. Routine maintenance is not required.

**POWER UNIT PREPARATION - ELECTRIC MOTORS:** Make certain the input power to your electric motor is proper, single phase or three phase, and is of the proper voltage according to the motor specification plate. Be sure of the proper motor rotation. Pump impeller should rotate counterclockwise, looking from the suction inlet side. For single phase motors consult the motor manufacturer's instructions for wiring for counterclockwise rotation. Three phase motor rotation may be reversed by inter-changing any two of the three power leads. Make certain that wiring for your electric motor complies with all existing local codes.

**POWER UNIT PREPARATION - GASOLINE ENGINE DRIVEN PUMPS:** For complete operating and maintenance information consult the engine manufacturer's instructions included with the engine. Before starting, fill crankcase with oil specified by the engine manufacturer. **CAUTION:** Always remove spark plug or spark plug wire before working on unit to prevent accidental starting.

**PUMP OPERATION:** This pump is self-priming, but the pump should never be operated unless there is liquid in the casing. **CAUTION:** The pump will not prime when dry. Operation of a dry pump will destroy the seal assembly. Add liquid to the pump casing when: **1.** The pump is being put into service for the first time. **2.** The pump has not been used for a considerable length of time. **3.** The liquid in the pump

casing has evaporated. Once the pump casing has been filled, the pump will prime and reprime as necessary. To fill the pump, remove the pump casing fill plug at the top of the casing and add clean liquid until the pump is filled. Replace the fill plug before operating the pump.

**STARTING:** Consult the operations manual furnished with the power source. **WARNING:** Do not use pump in explosive atmosphere. Do not pump volatile or flammable liquids.

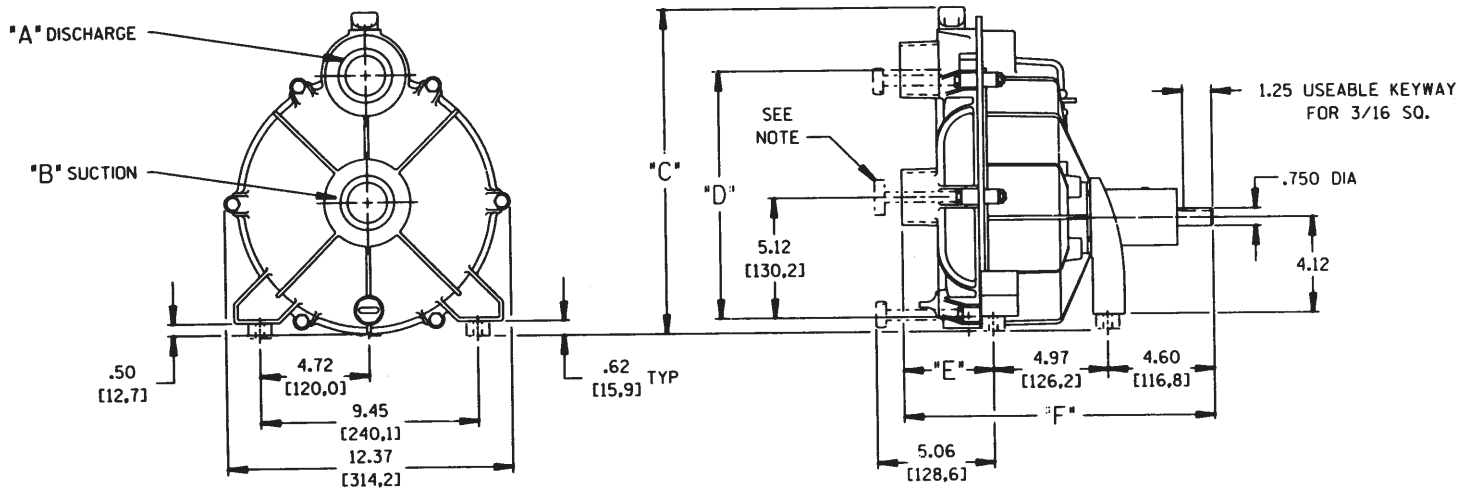
**OPERATION:** Open all valves in the discharge line and start the power source. Priming is indicated by a quieter operation. The pump may not prime immediately because the suction line must first fill with liquid. If the pump fails to prime within five minutes, stop it and check the suction line for leaks. After the pump has been primed, partially close the discharge line throttling valve in order to fill the line slowly and guard against excessive shock pressure which could damage the pump, pipe, gaskets, sprinkler heads, and any other fixtures connected to the line. When the discharge line is completely filled, adjust the throttling valve to the required flow rate. No leakage should be visible at pump mating surfaces, or at pump connections or fittings.

**LIQUID TEMPERATURE AND OVERHEATING:** The **maximum** liquid temperature for this pump is 160 degrees Fahrenheit. Do not apply it at a higher operating temperature. Overheating can occur if operated with the valves in the suction and discharge lines closed. Operating against closed valves could bring the liquid to a boil, build pressure, and cause the pump to rupture or explode. If overheating occurs, stop the pump and allow it to cool before servicing it. Refill the pump casing with cool liquid.

**STOPPING:** Never halt the flow of liquid suddenly. If the liquid being pumped is stopped abruptly, damaging shock waves can be transmitted to the pump and piping system. Close all connecting valves slowly. After stopping the pump, lock out the power supply to ensure that the pump will remain inoperative. Flush out the pump if the liquid being pumped will leave a sticky residue or will harden.

**DRAINING:** During freezing weather, be sure to drain the pump when it is not in use. Unscrew the drain plug and run engine or motor about half a minute without pumping.

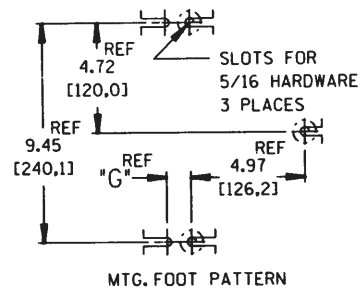
**STORAGE:** When the pump is out of service for long periods, drain it and store in a dry, well-ventilated room. Pull the engine hard against compression so that the valves will be sealed. (Never run pump dry for more than half a minute or the shaft seal may be damaged.)



NOTE:  
T-HANDLES USED ON TRASH PUMP MODELS.

MODEL	"A"	"B"	"C"	"D"	"E"	"F"	"G"
1.5"	1.5 [38,1]	1.5 [38,1]	13.31 [338,1]	10.55 [268,0]	3.99 [101,3]	13.56 [344,5]	1.06 [27,0]
2"	2.0 [50,8]	2.0 [50,8]	13.31 [338,1]	10.55 [268,0]	3.99 [101,3]	13.56 [344,5]	1.06 [27,0]
3"	3.0 [76,2]	3.0 [76,2]	14.55 [369,6]	11.14 [283,0]	6.54 [166,2]	16.11 [409,2]	1.12 [28,6]

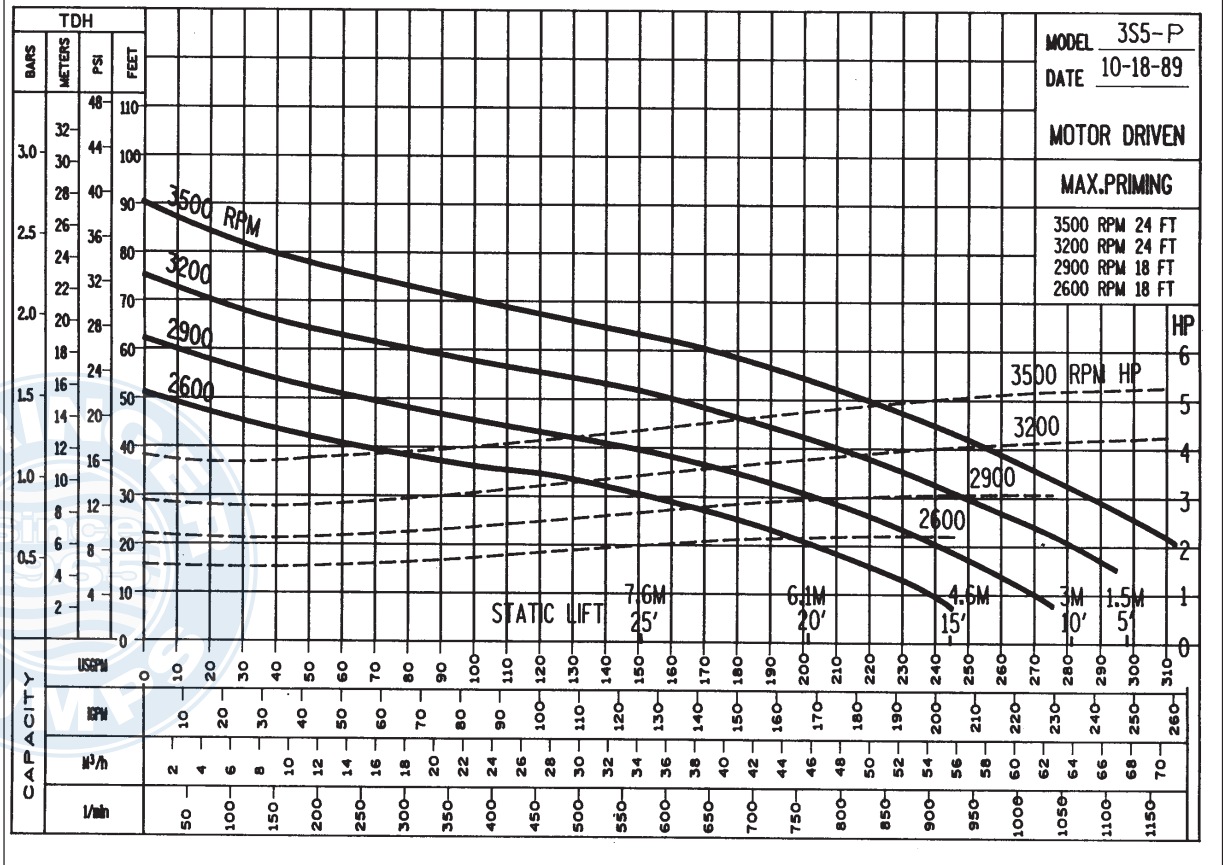
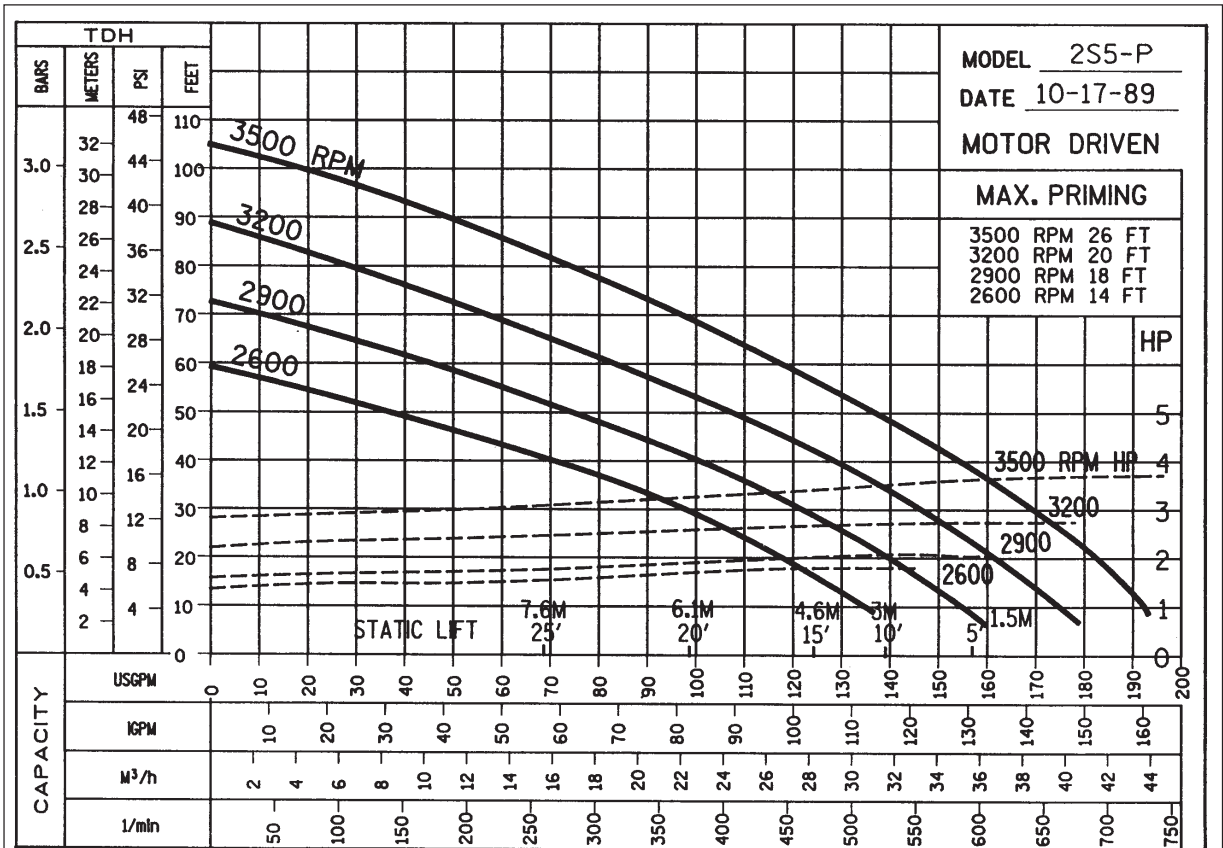
DIMENSIONS:  
INCHES  
[MILLIMETERS]

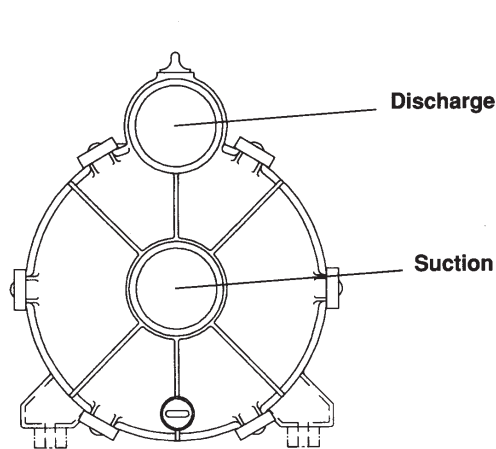


### MOUNTING DIMENSIONS

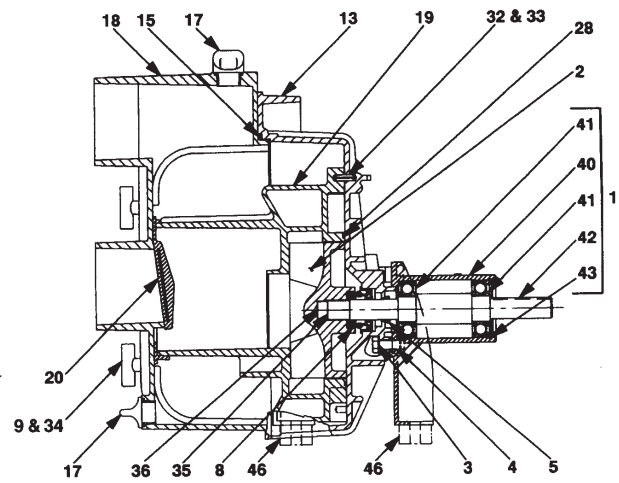
## TROUBLES AND THEIR CURES

If difficulties are experienced, in the majority of cases they can be traced to well-known causes. We suggest you check these points first to save needless expense. **(A)** Make sure the pump casing is full of cool liquid. **(B)** If difficulty continues, remove suction hose, start engine and hold a flat piece of rubber sheet, or other suitable material against the suction inlet. If the pump develops a strong pull against the material, the trouble is not in the pump. If there is no pull, the shaft seal may need replacing. **(C)** Examine suction hose or pipe connections. Air leaks in the suction line and connection to the pump are the most frequent causes of priming trouble. Use new gaskets in hose coupling. New couplings sometimes require 2 gaskets. Lining of hose may also become loose and clog the hose. **(D)** Keep pump as close to the level of the liquid being pumped. It will give best performance on suction lifts less than 15 feet. **(E)** Be sure strainer is not clogged. **(F)** There are no parts or valves to become clogged or out of adjustment. The only requirement is that the pump case is full of liquid. **(G)** Keep your pump unit clean and properly serviced. Care in this respect will repay in many years of trouble-free operation.





**BODY-FRONT**



**"S" THREADED**

## Parts List

REF. #	PART NAME	QTY	MODEL			
			2S5P	3S5P	2S5P	3S5P
			5/8" SHAFT	5/8" SHAFT	3/4" SHAFT	3/4" SHAFT
1	PEDESTAL (COMPLETE ASSY)	1	35-320-A	35-320-A	35-320-B	35-320-B
2	IMPELLER	1	2-127-A	2-313-A	2-127	2-313
3	SEALING WASHER (SET OF FOUR)	1	16-233-1	16-233-1	16-233-1	16-233-1
4	BOLT, 5/16-24 X 1.38 SST	4	19-216	19-216	19-216	19-216
5	SLINGER	1	12-117-B	12-117-B	12-117-B	12-117-B
8	SHAFT SEAL, SIC-VITON®	1	3-258-A	3-258-A	3-258-A	3-258-A
9	HANDLE	6	32-134	32-196	32-134	32-196
13 STD	BRACKET-ROTO FINISH	1	5-128-1B	5-128-1B	5-128-1B	5-128-1B
13 ALT	BRACKET-WHITE EPOXY	1	5-128-2B	5-128-2B	5-128-2B	5-128-2B
13 C.I. ALT	BRACKET-CAST IRON BLK	1	5-372-1B	5-372-1B	5-372-1B	5-372-1B
15 STD	BODY O-RING, EPDM	1	12-133	12-133	12-133	12-133
15 ALT	BODY O-RING, VITON®	1	12-133-A	12-133-A	12-133-A	12-133-A
17 STD	PLUG & O-RING EPDM	2	11-116-1	11-116-1	11-116-1	11-116-1
17 ALT	PLUG & O-RING VITON®	2	11-116-1A	11-116-1A	11-116-1A	11-116-1A
18 STD	BODY-ROTO FINISH	1	6-129-1A	6-131-1A	6-129-1A	6-131-1A
18 ALT	BODY-WHITE EPOXY	1	6-129-2A	6-131-2A	6-129-2A	6-131-2A
18 C.I. ALT	BODY-CAST IRON BLK	1	6-370-1A	6-371-1A	6-370-1A	6-371-1A
19	VOLUTE	1	1-139	1-312	1-139	1-312
20 STD	CHECK VALVE EPDM	1	7-136-1	7-137-1	7-136-1	7-137-1
20 ALT	CHECK VALVE VITON®	1	7-136-1A	7-137-1A	7-136-1A	7-137-1A
28 STD	O-RING EPDM	1	12-160	12-160	12-160	12-160
28 ALT	O-RING VITON®	1	12-160-A	12-160-A	12-160-A	12-160-A
32	ROLL PIN LONG	1	21-316	21-316	21-316	21-316
33	ROLL PIN SST	5	21-298	21-298	21-298	21-298
34	O-RING RETAINING (SET OF 6)	1	12-299-1	12-299-1	12-299-1	12-299-1
35	SHIM, IMPELLER (SET OF 4)	1	22-255-1A	22-255-1A	22-255-1	22-255-1
36	SPACER, IMPELLER	1	23-301-A	23-301-A	23-301	23-301
40	PEDESTAL HOUSING	1	35-320	35-320	35-320	35-320
41	BEARING	2	47-324	47-324	47-324	47-324
42	SHAFT	1	34-321	34-321	34-322	34-322
43	SNAP RING	1	37-325	37-325	37-325	37-325
46	SPACER (USE OPTIONAL)	3	28-258	28-258	28-258	28-258
NOT SHOWN	TRASH STRAINER	1	44-278	44-314	44-278	44-314
NOT SHOWN	SEAL & O-RING KIT EPDM STD	1	50-006	50-007	50-006	50-007
NOT SHOWN	SEAL & O-RING KIT VITON® ALT	1	50-006-A	50-007-A	50-006-A	50-007-A

**Seal and O-Ring Kit Contains:**

Body-O-Ring, Sealing Washer Set, Volute-O-Ring, Plugs, Shaft Seal, Spacer, Shim Set, Check Valve, Instruction Sheet, and Seal Installation Tool.

Viton is a registered trademark of DuPont Dow Elastomers.

Tel: 866-777-6060  
Fax: 866-777-6383

Springer Pumps, LLC

Website: [www.springerpumps.com](http://www.springerpumps.com)  
Int'l: +001 267 404 2910

## **How To Order Repair Parts For Your Self-Priming Centrifugal Pump**

All parts shown on the parts list and on the exploded view drawing may be ordered through the nearest distributor.

### **When Ordering Repair Parts, Always Give The Following Information:**

1. Identify pump model number.
2. Part name and number. (Not illustration number)
3. Quantity required.
4. Material specification if other than standard.

### **NOTES**



**|| WARNING!!** DO NOT USE PUMP IN EXPLOSIVE ATMOSPHERE  
DO NOT PUMP VOLATILE OR FLAMMABLE LIQUIDS **||**

## Installation & Operating Instructions Self-Priming Centrifugal Pump

### REPAIR AND MAINTENANCE INSTRUCTIONS:

To disassemble pump, follow these steps:

1. Remove handles (9).
2. Remove body (18).
3. Remove the volute (19).
4. Follow these instructions for removing the impeller (2): Remove the impeller by rotating the impeller counter-clockwise. It may be necessary to strike the end of one of the impeller vanes with a wood block and hammer to start the counter-clockwise rotation.
5. If the mechanical shaft seal (8) needs replacing:
  - a. With a screwdriver, pry the white seal ring and its rubber boot out of the back of the impeller.
  - b. Remove the pump bracket (rear housing) (13) by removing the four bolts (4).
  - c. To remove the seal assembly (8) from the rear housing, drive it out from behind.
6. To replace the seal component in the rear housing, coat the bore in the housing where the seal goes with gasket material (Permatex or equivalent) and press the seal component into the housing by using an arbor press or drill press. Use a short piece of pipe that fits on the small flange of the seal case so that you are not pressing on the delicate, finely finished, carbon seal ring. Do not damage the seal face.

7. To replace the seal component in the impeller hub, lubricate the outside of the rubber boot with vegetable oil or soap and press the white ring and rubber boot into the hub using your two thumbs. Be certain that the seal ring is all the way down and even with the back of the impeller so that the ring does not wobble when the impeller rotates on the shaft. Do not damage the surface of the white ring.
8. Re-assemble the pump in the reverse manner from the disassembly. Use thread sealant on four (4) bolts that bolt bracket to pedestal.

To disassemble the bearing pedestal, follow these steps:

1. Remove the pump - step 1 through 5b above.
2. Remove snap ring (43) and tap shaft out with rubber mallet or use wood block to protect shaft at impeller end.
3. Remove bearings with bearing puller or by tapping shaft off bearings. Use rubber mallet or wood block to protect shaft.
4. Clean bearing bores in pedestal and shaft surfaces and apply Loctite 609 or 620 or comparable product to shaft bearing surfaces and install bearings.
5. Apply the loctite or comparable product to bearing surfaces in pedestal and install shaft and bearings in pedestal.
6. Replace snap ring and re-assemble pump in reverse manner from disassembly.











American Machine & Tool Co., Inc. of PA  
(herein "AMT")  
400 Spring Street  
Royersford, PA 19468  
Phone: (610) 948-3800  
Fax: (610) 948-5300  
www.amtpump.com



## General Information

**SALES POLICY:** AMT products are sold through our established Distributors. We do not sell direct to the consumer or organization not entitled to trade recognition. Therefore, possession of our catalogs and/or price list(s) does not infer an offer to sell.

**MINIMUM ORDER:** We appreciate your order, however, all orders are subject to a minimum \$35.00 net invoice charge (excluding freight). This applies to all pump and parts purchase orders.

**PRICES:** Prices are subject to change without notice. All orders accepted are subject to prices in effect at time of shipment.

**PAYMENT TERMS:** Terms, upon establishment of credit, are Net 30 days. Past due accounts may be subject to a service charge of 1.5% per month. Domestic or assignable letter of credit is required for all export trade.

**PAST DUE ACCOUNTS:** AMT reserves the right to withhold open account shipments on any past due account. Invoices are considered past due after thirty (30) days. In the interest of sound business, all orders are subject to approval of the Credit Department.

**SHIPPING INSTRUCTIONS:** All shipments will be made F.O.B. the factory. Where instructions for shipment do not appear on the order, the shipment will be made according to our best judgment. Full risk of loss (including transportation delays and losses) shall pass to the customer upon delivery of the products to the carrier at the F.O.B. point. When loss or delay occurs, primary responsibility for tracing rests with the customer. When there is LOSS or APPARENT VISIBLE DAMAGE to a shipment, when tendered for delivery, *DO NOT* give the carrier a clear receipt. Note such damage on the carrier's delivery receipt and *HAVE THE DRIVER SIGN THE RECEIPT.*

**PRODUCT REVISIONS:** AMT reserves the right to discontinue, change or improve its products or any portions thereof without being obligated to provide such a change or improvement for units sold and/or shipped prior to such a change or improvement.

**LEAD TIME:** Products designated "Quick Ship Product", also referred to as "QSP" will normally be shipped within 24 hours of receipt of a non-cancellable purchase order. Only limited quantities of "QSP" pumps are available.

**STANDARD LEAD TIME:** Lead time is two weeks for all non "QSP" product. AMT reserves the right to revise lead times as required due to availability of materials and all other causes beyond our control.

**VIP SHIPMENT:** Select AMT and IPT branded pumps are available for next day shipment for non-QSP (Quick Ship Products) items and subjected to a specific model surcharge per unit noted in the respective price book. Requires calling for availability, confirmation and a non-cancellable purchase order or credit card payment prior to shipment. The expedited shipping charges are an additional cost added separately from the VIP charges per item. AMT reserves the right to revise lead times as required due to availability of materials and all other causes beyond our control. QSP quantities are limited as determined by AMT.

ALL purchase orders must be submitted via hard copy sent to AMT customer service department by fax, EDI or e-mail.

**RETURN GOODS POLICY:** Goods shall not be returned without a return goods authorization number (RGA) issued by AMT customer service. The RGA number must be listed on the packing list. Only current model and part numbers with a valid date code may be returned (within one year from date of purchase). **A 20% restocking and packaging charge will apply to all returns. All shipping charges must be pre-paid. No exceptions.**

**ORDER CHANGES BY CUSTOMER:** Orders in process may not be changed except with written consent and may be subject to special charges.

## 12 Month Limited Warranty

### EXTENT AND DURATION OF LIMITED WARRANTY

**Coverage:** American Machine & Tool Company (herein "AMT") or IPT Pumps by Gorman-Rupp (herein "IPT") or Gorman-Rupp Industries Division of The Gorman-Rupp Company, Patterson, or the Gorman-Rupp Company (herein referred to as "G-R Unit") each individually warrants that its products and parts shall be free from defects in material and workmanship for twelve (12) months from the date of purchase by the original end user when installation is made and maintenance is performed in accordance with G-R Unit's recommendations. Wear and tear resulting from use and items normally consumed in use are not covered.

### EXCEPTIONS

( A ) This Limited Warranty shall not apply to mechanical seals in AMT or IPT pumps and the following products and parts: engines, motors, trade accessories and all other products, components, parts and materials not manufactured by the G-R Units. These items may, however, be covered by the warranties of their respective manufacturers. ( B ) This warranty does not extend to or apply to any unit which has been repaired or altered at any place other than by a G-R Unit, or by persons not expressly approved by a G-R Unit to make repairs or alterations, nor to any unit the serial number, model number or identification of which has been removed, defaced or altered. ( C ) This warranty does not extend to any product manufactured by a G-R Unit, which has been subjected to mis-use, neglect, accident, improper installation, or use in violation of instructions furnished by a G-R Unit. ( D ) Pump Kits: This warranty does not extend to any product sold by a G-R Unit unassembled as a Pump Kit. Pump Kits are warranted against defects in material and workmanship for 60 days from the date of shipment from a G-R Unit. Any Pump Kit parts deemed defective by a G-R Unit will be replaced free of charge within 60 days of shipment. Pump Kits are not returnable for credit.

### LIMITATIONS

**THE G-R UNITS' SOLE AND EXCLUSIVE WARRANTY WITH RESPECT TO THEIR PRODUCTS AND PARTS IS THIS LIMITED WARRANTY. THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER EXPRESS AND/OR IMPLIED WARRANTIES, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE.**

### EXCLUSIVE REMEDY AND DAMAGES

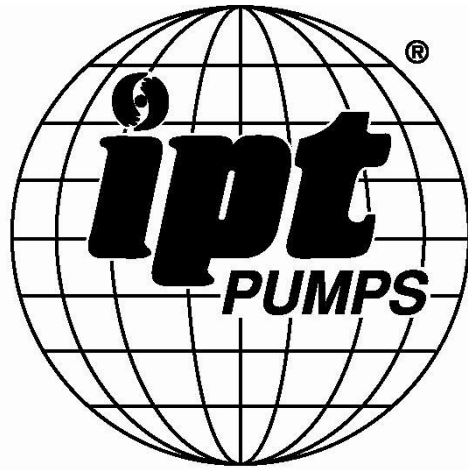
The sole and exclusive remedy for breach of this Warranty by a G-R Unit and the entire extent of its liability for such breach or for damages arising from the use of the products and parts covered under this Limited Warranty, shall be as follows:

- Repair or Replacement:** If inspection shows that any G-R Unit product or part covered under this Limited Warranty is defective in materials or workmanship, the G-R Unit shall repair or replace the defective or non-conforming product or part without charge, whichever the G-R Unit chooses. You must have properly maintained and used the product or part claimed to be defective in accordance with the maintenance schedule or manual, which comes with the product. No allowance will be made for labor, installation, removal, transportation or other charges incurred by you in connection with such repair or replacement.
- To obtain the above remedy:
  - Immediately notify the G-R Unit upon discovery of the claimed defect in materials or workmanship and provide the serial number or date code of the product and/or part(s) or provide the G-R Unit with the invoice or bill of sale referencing the product by no later than the expiration date of the warranty period.
  - The G-R Unit will advise whether inspection will be necessary and how whether repair or replacement will be made. If inspection by the G-R Unit is necessary, the pump or defective part must be sent freight pre-paid to the G-R Unit. Return shipment will be F.O.B. the G-R Unit's plant.
  - Return Goods Authorization Requirement:** No product will be accepted for return or replacement without the prior written authorization of the G-R Unit. Upon such authorization, and in accordance with instructions from the G-R Unit, the product will be returned to the G-R Unit, shipping charges prepaid by the Buyer.
- Damages:** The G-R Unit's liability for damages for breach of this Limited Warranty shall not exceed the amount of the purchase price of the product or part(s) in respect to which Such damages are claimed. **IN NO EVENT SHALL THE G-R UNITS BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES FOR BREACH OF THIS LIMITED WARRANTY.**

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Limited Warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.



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