

## Inline Centrifugal Circulator Pumps

- **Cast Iron or Silicon Bronze Construction**
- **EPDM Mechanical Seal and Casing O-ring**
- **Optional Buna-N Mechanical Seal and O-Ring**
- **Investment Cast Stainless Steel Impeller with 569/570/571 Series, 572 Series includes Silicon Bronze Impeller**
- **Accessory Mounting Flanges Available 3/4" to 2" NPT**
- **Max Working Pressure 150 PSI**
- **Max. Temperature 225°F (107° C)\***
- **Max. Flow 55 GPM**
- **Max. Head 19 ft. (8 PSI)**
- **Single Phase 1/4 HP, 1725 RPM, 115V ODP 56J Motor with Overload Protection**



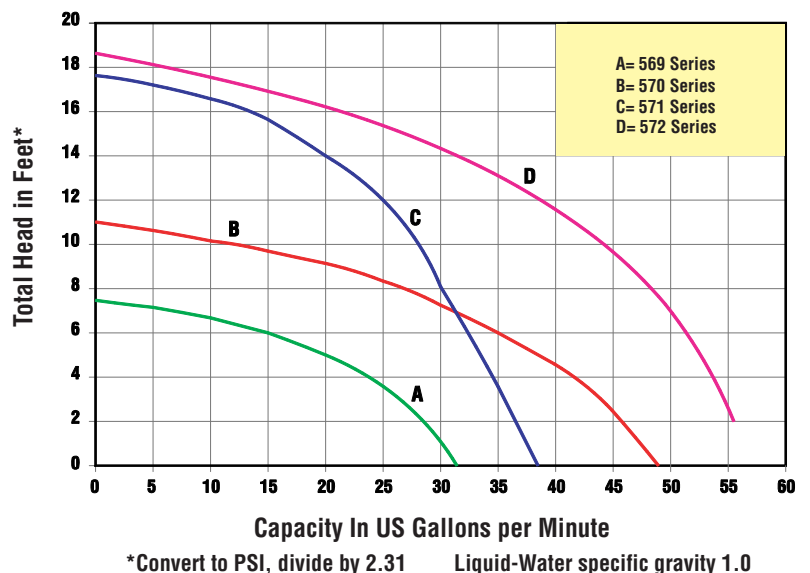
**Bronze Circulator Pump**

Patterson Inline Circulator Pumps are designed for continuous duty industrial/commercial systems. Pumps are available in a variety of material configurations to meet your specifications. All models are powered by a single phase 115V ODP 56J NEMA frame 1/4 HP electric motor with 1/2-14 NPSM conduit connection. Direct coupled design eliminates stub shaft, oiled bearing and and coupling, reducing maintenance. Pumps are interchangeable with other manufacturers, see cross reference on specification page.

Patterson Inline Circulator Pumps are reliable, cost effective and low maintenance. Pumps are available "Off-the-Shelf" for fast 24 hour shipment. For use with non-flammable liquids which are compatible with pump component materials.

\* Max. temperature applies to water only.

**Performance of Inline Circulator Pumps**  
Based on Maximum Flange Size @ 1725 RPM

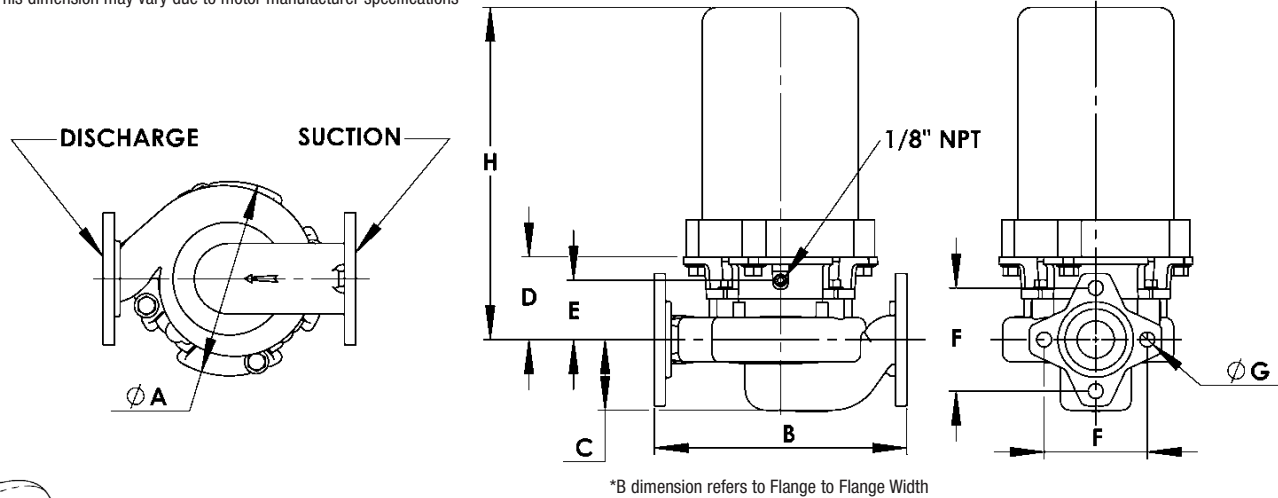


# Inline Centrifugal Circulator Pumps

## Pump Dimensional & Specification Data

C. Iron Model	Curve	Ship WT. (lbs.)	Bronze Model	Ship WT. (lbs.)	HP	PH	ENC	VAC VAC 60hz	FL AMPS	A	B	C	D	E	F	G	H
5690-95	A	23	5690-97	25	1/4	1	ODP	115	5.4	7	6.38	2.16	2.78	2	3.16	0.5	11.18
5700-95	B	25	5700-97	28	1/4	1	ODP	115	5.4	7	8.5	2.38	2.78	2	3.47	0.5	11.18
5710-95	C	26	5710-97	28	1/4	1	ODP	115	5.4	7	8.5	2.38	2.78	2	3.47	0.5	11.18
5720-95	D	26	5720-97	28	1/4	1	ODP	115	5.4	7	8.5	2.38	2.78	2	3.47	0.5	11.18

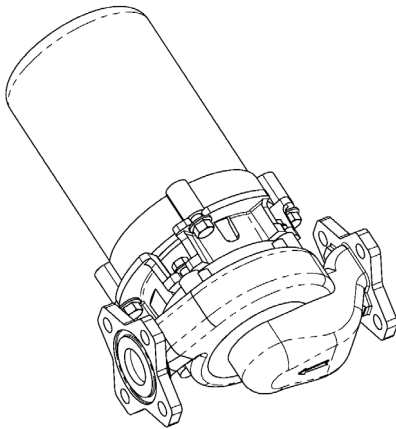
**NOTE:** Dimensions have a tolerance of  $\pm 1/8"$ .  
 When ordering add the correct -9x suffix to model number indicating material selection  
 569/570/571 Series -SS Impeller  
 572 series - Bronze Impeller  
 \*This dimension may vary due to motor manufacturer specifications



Pumps are designed to mount horizontally or vertically

### Connection Flanges - Flange Kit Model Numbers

Flanges Available - Standard NPT (female) pipe thread



Model Series	3/4"	1"	1-1/4"	1-1/2"	2"	Flange Face to NPT Face Thickness
569 Series XCI	C569-90	C569-91	C569-92	N/A	N/A	3/4"
569 Series XB	C569-93	C569-94	C569-95	N/A	N/A	3/4"
570 & 571 series XCI	C570-90	C570-91	C570-92	C570-93	N/A	3/4"
570 & 571 series XB	C570-94	C570-95	C570-96	C570-97	N/A	3/4"
572 Series XCI (-95)	N/A	N/A	N/A	N/A	C570-98	1-1/2"
572 Series XCI (-97)	N/A	N/A	N/A	N/A	C570-99	1-1/2"

**NOTE:** NPT flange kits include: 2 flanges, 2 Buna-N gaskets, 4 bolts and nuts

## Standard Features

- 4-Bolt flange allows 360° mounting rotation in 90° increments
- 1/8" NPT seal wash/vent port shipped plugged
- EPDM Mechanical Seals and O-Rings
- Optional Buna-N Mechanical Seal and O-Ring Available
- Close coupled design reduces maintenance requirements
- Standard NEMA 56J motor mounting dimensions
- Stainless Steel (300 series) Motor Shaft
- High Efficiency Closed Impeller
- Inline Centered Design, Centerline of Ports In Line with Motor Shaft

### Manufacturers Cross Reference

AMT SERIES	Flange to Flange Width*	Bell & Gossett Series	Armstrong Series	TACO Series	Dayton (C.Iron)
569	6.38	100NFI	S-25	110	4RD16
570	8.5	HV NFI	H-32	111	4RC93
571	8.5	PR	H-41	113	4RC91
572	8.5	2NFI	S-35	120	4RC95

\*Refers to B dimensions



See price book page 29

The Gorman-Rupp Company reserves the right to discontinue any model or change specifications at any time without incurring any obligation.

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CP79-80/0706



# Inline 3" Circulator Pumps

- **Cast Iron or Silicon Bronze Construction**
- **EPDM Mechanical Seal and Casing O-ring**
- **Optional Buna-N Mechanical Seal and O-Ring**
- **Silicon Bronze Impeller**
- **Includes Mounting Flange Kit for 3" NPT**
- **Max Working Pressure 150 PSI**
- **Max. Temperature 225°F (107° C)\***
- **Max. Flow 150 GPM**
- **Max. Head 28 ft. (12 PSI)**
- **Single Phase or Three Phase TEFC 56C Motor**



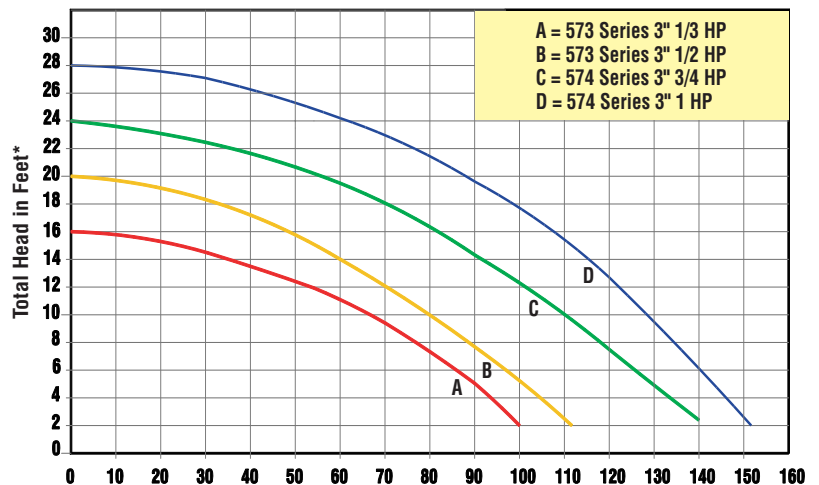
**5740-97 Bronze Circulator Pump**

Patterson Inline Circulator Pumps are designed for continuous duty industrial/commercial systems. Pumps are available in a variety of material configurations to meet your specifications. Pumps are powered by a 56C NEMA frame electric motor with 1/2" conduit connection. Pumps are interchangeable with other manufacturers, see cross reference on specification page.

Patterson Inline Circulator Pumps are reliable, cost effective and low maintenance. Pumps are available "Off-the-Shelf" for fast 24 hour shipment. For use with non-flammable liquids which are compatible with pump component materials.

\*Max. temperature applies to water only.

**Performance of Inline Circulator Pumps**



Capacity in US Gallons per Minute @ 1725 RPM  
 \*Convert to PSI, divide by 2.31    Liquid-Water specific gravity 1.0

# Inline 3" Circulator Pumps

## Pump Dimensional & Specification Data

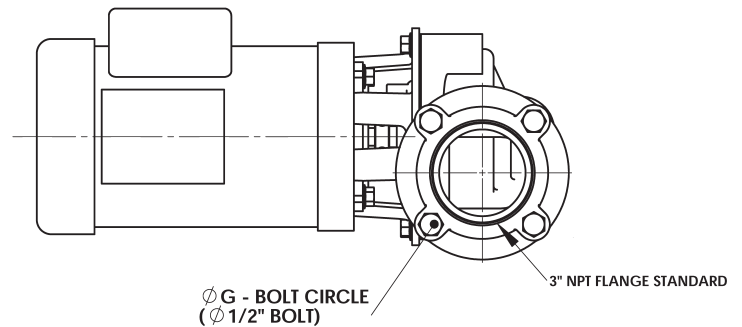
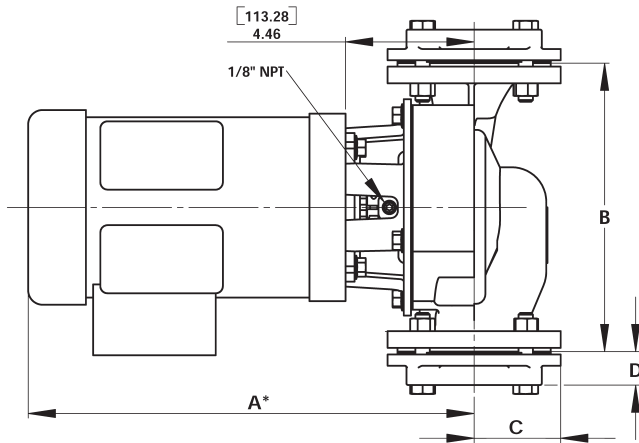
C.Iron Model	Curve	Ship WT. (lbs.)	Bronze Model	Ship WT (lbs.)	HP	PH	ENC	VAC 60hz	FL AMPS	A*	B	C	D	E	F	G
5735-95	A	72	5735-97	78	1/3	1	TEFC	115/230	7/4	14	10	3	1.12	5	3	5.05
5736-95	A	69	5736-97	75	1/3	3	TEFC	230/460	2/1	14	10	3	1.12	5	3	5.05
5730-95	B	77	5730-97	84	1/2	1	TEFC	115/230	9/5	14	10	3	1.12	5	3	5.05
5731-95	B	71	5731-97	77	1/2	3	TEFC	230/460	3/2	14	10	3	1.12	5	3	5.05
5745-95	C	83	5745-97	90	3/4	1	TEFC	115/230	12/6	15	12	3	1.12	5	3.25	5.05
5746-95	C	77	5746-97	84	3/4	3	TEFC	230/460	3/2	15	12	3	1.12	5	3.25	5.05
5740-95	D	90	5740-97	97	1	1	TEFC	115/230	14/7	15	12	3	1.12	5	3.25	5.05
5741-95	D	84	5741-97	91	1	3	TEFC	230/460	4/2	15	12	3	1.12	5	3.25	5.05

**NOTE:** Electric supply for ALL motors must be within  $\pm 10\%$  of nameplate voltage rating (Ex. 230V  $\pm 10\%$  = 207 to 253)

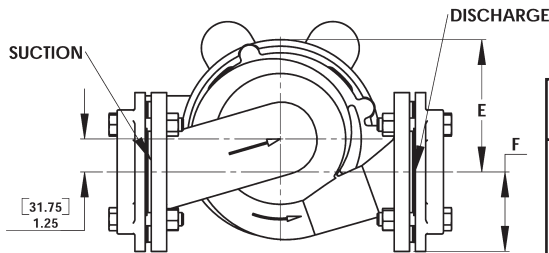
**NOTE:** Dimensions have a tolerance of  $\pm 1/8"$

When ordering add the correct -9x suffix to model number indicating material selection

\*This dimension may vary due to motor manufacturer's specifications



Pumps are designed to mount horizontally or vertically



### Manufacturers Cross Reference

AMT SERIES	Flange to Flange Width	Bell & Gossett Series (C.Iron)	Bell & Gossett Series (Bronze)	Armstrong Series	TACO Series	Dayton (C.Iron)
5735/5736	10	LD3	LD3AB	S-45	122	4RC99
5730/5731	10	HD3	HD3AB	S-46	131	4RD12
5745/5746	12	PD-35S	PDB35S	S-55	132	4RD13
5740/5741	12	PD-37S	PDB37S	S-56	133	4RD14

## Standard Features

- Mounting Flange Kit for 3" NPT, which includes (2) flanges, (2) gaskets, and fasteners
- 4-Bolt flange allows 360° mounting rotation in 90° increments
- 1/8" NPT seal wash/vent port
- EPDM Mechanical Seal and O-Rings
- Optional Buna-N Mechanical Seal and O-Ring Available
- Stainless Steel (300 series) Stub Shaft
- High Efficiency Closed Impeller
- Standard NEMA 56C motor mounting dimensions
- Available in either Single Phase or Three Phase TEFC 56C Motors



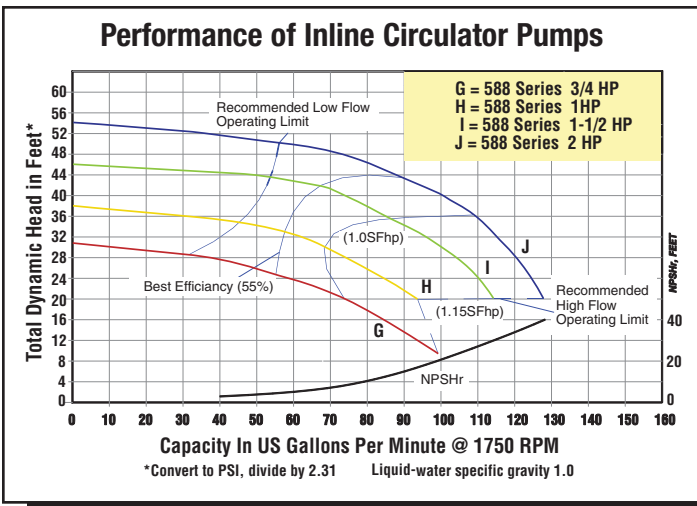
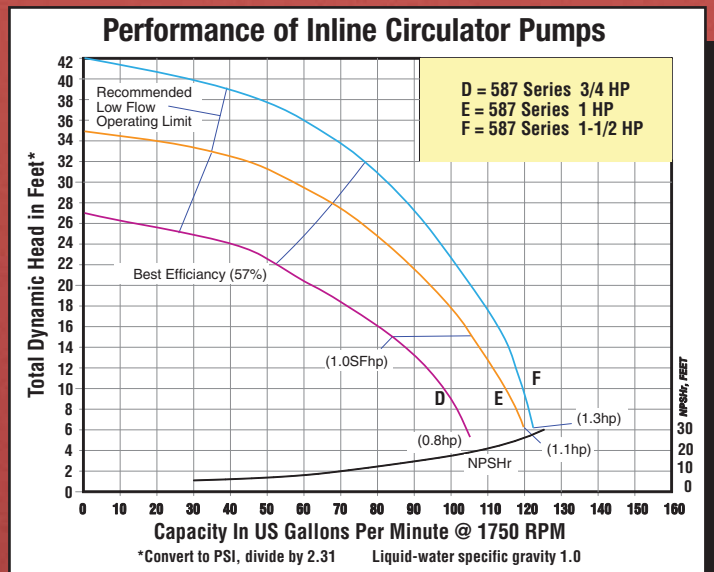
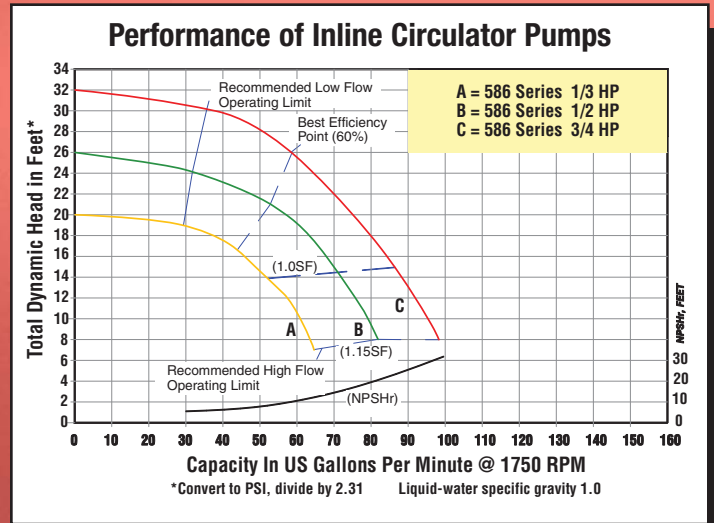
# Inline 1-1/2" Circulator Pumps

- **Cast Iron or Silicon Bronze Construction**
- **EPDM Mechanical Seal and Casing O-ring Standard**
- **Optional Viton® Mechanical Seal and O-ring**
- **Silicon Bronze Impeller**
- **Includes Mounting Flange Kit for 1-1/2" NPT**
- **Special Flange Designed to Accept B&G Flange or Standard 150lb 4-Bolt Flange**
- **Max. Water Temperature 225°F (107°C)**
- **Max. Flow 130 GPM**
- **Max. Head 53 ft. (23 PSI)**
- **1/8" NPT Seal Wash/Vent Port**
- **Single Phase or Three Phase TEFC 56C Motor**

Patterson Inline Circulator Pumps are designed for continuous duty industrial/commercial systems. Pumps are available in a variety of material configurations to meet your specifications. Pumps are powered by a 56C NEMA Totally Enclosed Fan Cooled (TEFC) frame electric motor with 1/2" conduit connection. Pumps are interchangeable with other manufacturers. Maximum working pressure 150 PSI. For use with non-flammable liquids which are compatible with pump component materials.



**5860-95  
Cast Iron  
Circulator Pump**



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# Inline 1-1/2" Centrifugal Circulator Pumps

## Pump Dimensional & Specification Data

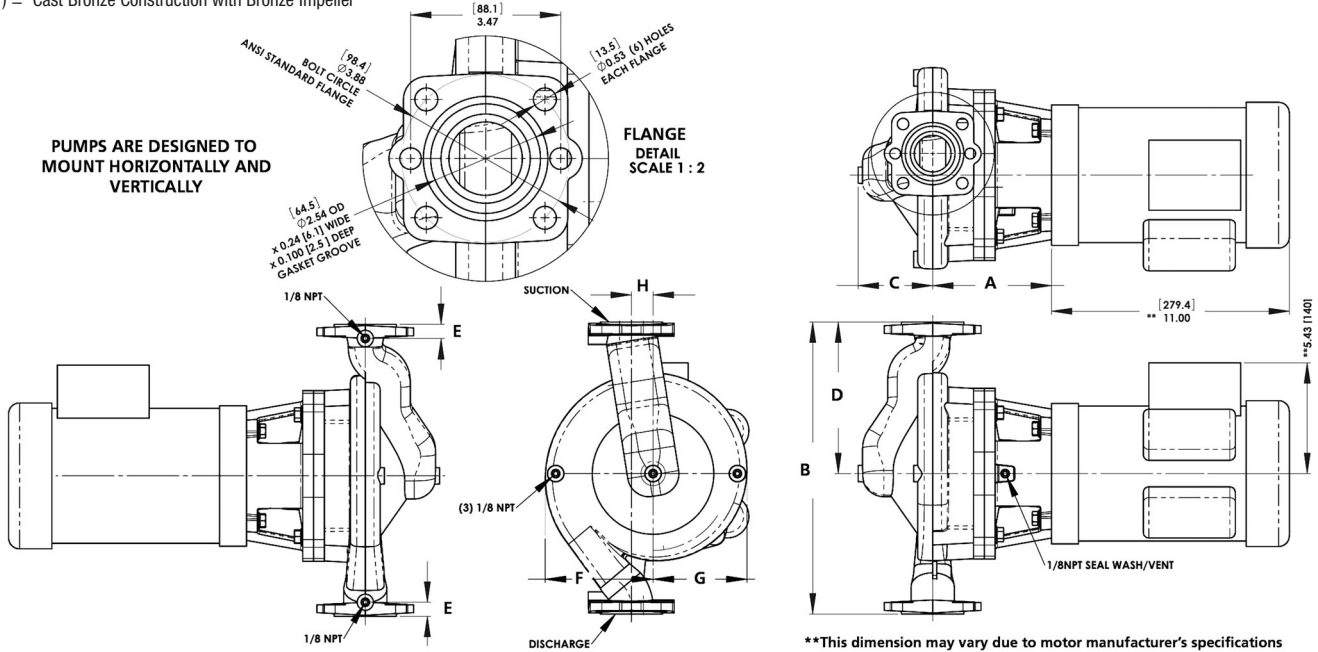
AMT Cast Iron Model	Ship Wt. (lbs.)	Curve	AMT Bronze Model	Ship Wt. (lbs.)	HP	PH	ENC	VAC 60 Hz	FL AMPS	A	B	C	D	E	F	G	H	B&G C. Iron Equiv.	B&G Bronze Equiv.
5864-95	76	A	5864-97	80	1/3	1	TEFC	115/230	7/4	5.4	11.5	3.1	6.5	0.5	4	4	1.4	607S	B607S
5865-95	73	A	5865-97	77	1/3	3	TEFC	230/460	2/1	5.4	11.5	3.1	6.5	0.5	4	4	1.4	607T	B607T
5862-95	80	B	5862-97	84	1/2	1	TEFC	115/230	9/5	5.4	11.5	3.1	6.5	0.5	4	4	1.4	608S	B608S
5863-95	76	B	5863-97	80	1/2	3	TEFC	230/460	3/2	5.4	11.5	3.1	6.5	0.5	4	4	1.4	608T	B608T
5860-95	86	C	5860-97	90	3/4	1	TEFC	115/230	12/6	5.4	11.5	3.1	6.5	0.5	4	4	1.4	609S	B609S
5861-95	80	C	5861-97	84	3/4	3	TEFC	230/460	3/2	5.4	11.5	3.1	6.5	0.5	4	4	1.4	609T	B609T
5874-95	83	D	5874-97	87	3/4	1	TEFC	115/230	12/6	5.4	13.5	3.6	7	0.7	4.6	4	1	621S	B621S
5875-95	82	D	5875-97	86	3/4	3	TEFC	230/460	3/2	5.4	13.5	3.6	7	0.7	4.6	4	1	621T	B621T
5872-95	88	E	5872-97	92	1	1	TEFC	115/230	14/7	5.4	13.5	3.6	7	0.7	4.6	4	1	613S	B613S
5873-95	86	E	5873-97	90	1	3	TEFC	230/460	4/2	5.4	13.5	3.6	7	0.7	4.6	4	1	613T	B613T
5870-95	98	F	5870-97	102	1.5	1	TEFC	115/230	17/9	5.4	13.5	3.6	7	0.7	4.6	4	1	614S	B614S
5871-95	90	F	5871-97	94	1.5	3	TEFC	230/460	5/3	5.4	13.5	3.6	7	0.7	4.6	4	1	614T	B614T
5886-95	84	G	5886-97	89	3/4	1	TEFC	115/230	12/6	5.5	13.5	3.4	7	0.7	5	4.3	1	622S	B622S
5887-95	82	G	5887-97	87	3/4	3	TEFC	230/460	3/2	5.5	13.5	3.4	7	0.7	5	4.3	1	622T	B622T
5884-95	89	H	5884-97	94	1	1	TEFC	115/230	14/7	5.5	13.5	3.4	7	0.7	5	4.3	1	623S	B623S
5885-95	87	H	5885-97	92	1	3	TEFC	230/460	4/2	5.5	13.5	3.4	7	0.7	5	4.3	1	623T	B623T
5882-95	99	I	5882-97	104	1.5	1	TEFC	115/230	17/9	5.5	13.5	3.4	7	0.7	5	4.3	1	617S	B617S
5883-95	91	I	5883-97	96	1.5	3	TEFC	230/460	5/3	5.5	13.5	3.4	7	0.7	5	4.3	1	617T	B617T
5880-95	100	J	5880-97	105	2	1	TEFC	115/230	22/11	5.5	13.5	3.4	7	0.7	5	4.3	1	618S	B618S
5881-95	92	J	5881-97	97	2	3	TEFC	230/460	6/3	5.5	13.5	3.4	7	0.7	5	4.3	1	618T	B618T

NOTE: Electric supply for all motors must be within ±10% of nameplate voltage rating (Ex. 230V ± 10%= 207 to 253)

NOTE: Dimensions have a tolerance of ± 1/8"

XCI (-95) = Cast Iron Construction with Bronze Impeller

XB (-97) = Cast Bronze Construction with Bronze Impeller



## Standard Features

- Includes Mounting flange Kit for 1-1/2" NPT; includes (2) flanges, (2) gaskets and fasteners
- Special flange designed to accept B&G flange or standard 150 lb 4 bolt flanges
- 1/8" NPT seal wash/vent port
- EPDM Mechanical Seal and Casing O-Ring Standard
- Optional Viton® Mechanical Seals and O-Rings Available
- Stainless Steel (300 Series) Sleeve protects stub shaft from liquid.
- Steel shaft with Sealed Ball Bearing design permits removal of motor without disconnecting pump or loss of liquid.
- High Efficiency Closed Bronze Impeller
- Available in either Single or Three Phase TEFC 56C Motors with standard NEMA mounting dimensions

Please read and save this Repair Parts Manual. Read this manual and the General Operating Instructions carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. The Safety Instructions are contained in the General Operating Instructions. Failure to comply with the safety instructions accompanying this product could result in personal injury and/or property damage! Retain instructions for future reference. AMT reserves the right to discontinue any model or change specifications at any time without incurring any obligation.

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**WARNING** Periodic maintenance and inspection is required on all pumps to insure proper operation. Unit must be clear of debris and sediment. Inspect for leaks and loose bolts. Failure to do so voids warranty.

## Patterson/AMT Inline Circulator Pumps

Refer to General Pump manual 1808-633-00 for General Operating and Safety Instructions.  
See General Pump Manual for additional Safety and Installation information

**Description:**

Patterson/AMT Inline Circulator Pumps are designed for continuous duty industrial/commercial applications. Pumps are designed for liquid circulation in HVAC and industrial/commercial systems. Pumps are available in cast iron or bronze configurations to meet your specification. Pump casing is equipped with 1/8" NPT suction and discharge gauge ports. Pumps are powered by a 56C NEMA frame electric motor with 1/2" conduit connection. Pump is equipped with precision lapped mechanical shaft seal to reduce the likelihood of leakage, o-ring sealed casing, and a bronze closed impeller. Liquid temperature range is 40° to 200° F (4° to 93° C. Liquid viscosity and specific gravity must be close to water; 31 SSU and 1.00.

Maximum casing pressure is 150 psi. Pump shipped with NPT flanges, flange gaskets and flange installation hardware.

All single phase motors are equipped with automatic thermal protection. Overload protection is recommended for three phase motors but is not supplied. Check motor wiring before putting unit into service (see motor nameplate for specific wiring diagram). These are manual units, no controls are supplied.

**WARNING**

*All units are for use with non-flammable, non-abrasive liquids compatible with pump component materials.*

**Specifications:**

Suction inlet . . . . . 1.5" NPT Flanged  
Discharge outlet . . . . . 1.5" NPT Flanged  
Motor . . . TEFC 1725 RPM, 56C NEMA Frame

**CAST IRON UNITS (-95)**

Pump construction is cast iron casing, seal plate and adapter. Cast bronze impeller. EPDM type 21 mechanical shaft seal with carbon and ceramic wear faces. EPDM o-ring casing seal.

**BRONZE UNITS (-97)**

Pump construction is cast bronze casing and seal plate with cast iron adapter. Cast bronze impeller. EPDM type 21 mechanical shaft seal with carbon and ceramic wear faces. EPDM o-ring casing seal.

Cast Iron Model	Bronze Model	HP	PH	VAC	Max amps	Overall Dimensions
5864-95	5864-97	1/3	1	115/230	7/4	19.5L x 11.5W x 8.1H
5865-95	5865-97	1/3	3	230/460	2/1	19.5L x 11.5W x 8.1H
5862-95	5862-97	1/2	1	115/230	9/5	19.5L x 11.5W x 8.1H
5863-95	5863-97	1/2	3	230/460	3/2	19.5L x 11.5W x 8.1H
5860-95	5860-97	3/4	1	115/230	12/6	19.5L x 11.5W x 8.1H
5861-95	5861-97	3/4	3	230/460	3/2	19.5L x 11.5W x 8.1H
5874-95	5874-97	3/4	1	115/230	12/6	20.1L x 13.5W x 8.7H
5875-95	5875-97	3/4	3	230/460	3/2	20.1L x 13.5W x 8.7H
5872-95	5872-95	1	1	115/230	14/7	20.1L x 13.5W x 8.7H
5873-95	5873-95	1	3	230/460	4/2	20.1L x 13.5W x 8.7H
5870-95	5870-97	1 1/2	1	115/230	18/9	20.1L x 13.5W x 8.7H
5871-95	5871-97	1 1/2	3	230/460	5/3	20.1L x 13.5W x 8.7H
5886-95	5886-97	3/4	1	115/230	12/6	20.1L x 13.5W x 9.5H
5887-95	5887-97	3/4	3	230/460	3/2	20.1L x 13.5W x 9.5H
5884-95	5884-97	1	1	115/230	14/7	20.1L x 13.5W x 9.5H
5885-95	5885-97	1	3	230/460	4/2	20.1L x 13.5W x 9.5H
5882-95	5882-97	1 1/2	1	115/230	18/9	20.1L x 13.5W x 9.5H
5883-95	5883-97	1 1/2	3	230/460	5/3	20.1L x 13.5W x 9.5H
5880-95	5880-97	2	1	115/230	20/10	20.1L x 13.5W x 9.5H
5881-95	5881-97	2	3	230/460	6/3	20.1L x 13.5W x 9.5H

Performance Chart (1725 rpm, water @ 70°F)

Model	Model	GPM @ Total Head in Feet						Max. Head (Feet)
		10'	15'	20'	30'	40'	50'	
5864	5865	60	52	0	-	-	-	20'
5862	5863	79	70	57	-	-	-	26'
5860	5861	95	86	75	39	-	-	32'
5874	5875	98	82	61	-	-	-	27'
5872	5873	115	105	94	55	-	-	35'
5870	5871	120	115	105	82	30	-	42'
5886	5887	98	85	73	0	-	-	31'
5884	5885	nr	nr	93	67	-	-	38'
5882	5883	nr	nr	113	100	73	-	46'
5880	5881	nr	nr	127	117	100	55	54'

**Unpacking:**

Refer to Repair Parts Illustration and Repair Parts List to aid in identifying parts. Unpack and separate all pump components from shipping/packaging materials, making sure all parts are accounted for. Retain all manuals for reference. Package should contain: Pump, flanges, circulator pump specific manual, general pump manual.

**Installation**

1. Pump is designed for circulating liquid in a closed system or a flooded suction application. Pump will not self prime or run in a system where the suction pressure is below atmospheric pressure.
2. Locate the pump so that there is sufficient room for maintenance and servicing.
3. There must be a sufficient supply of cooling air and ventilation around the pump and motor to avoid excessive component temperatures.
4. Installing a shutoff valve in both the suction and discharge piping will make removal and servicing of the pump possible without draining the entire system.
5. Support the piping near the pump's suction and discharge with sufficient pipe hangers. This will minimize pipe strain.
6. Make sure bolt holes in pipe flange line up with bolt holes in pump flange.

**CAUTION** Do not spring the suction or discharge piping into position. This will result in excessive strain in the piping, flanges and pump casing.

**Orienting Pump**

7. The pump can be oriented in any desired position: discharge up or down, left or right.
8. If motor is oriented vertically up, a means of venting air from the seal chamber must be installed in the seal plate (Ref. No. 8) 1/8" NPT port.

Remove 1/8" NPT plug (Ref. No. 6) and install air venting device or liquid injection line.

9. If motor is oriented vertically down, any liquid breaching the mechanical shaft seal will run directly down shaft into motor.

**Installing Flanges**

10. Included with pump: (2) 1.5" NPT flanges, 2 gaskets, and 4 bolts, nuts and washers.
11. Install flanges on piping using sealing tape or pipe sealant.
12. Insert gasket into machined groove on pump flange.
13. Position pump by lining up bolt holes on pump flange with bolt holes on pipe flange.
14. Install 4 hex head bolts, nuts and washers. Torque both flange bolts in even increments to a value of 8-11 ft-lbs (1.1-1.5 Kg-m). Torque the bolts in both the suction and discharge flanges in this manner.

**Operation:**

1. Prior to pump start up, ensure system is clean and filled with clean liquid that is compatible with pump components.
2. Pressurize the pump body slowly. Check for leaks at the flange joint, the pump casing and motor shaft.

**CAUTION** Pressurize pump casing slowly. Failure to check for leaks at all joints sealed with a gasket may result in personal injury or property damage.

3. DO NOT RUN PUMP DRY!  
Mechanical shaft seal damage will occur if pump is run dry. Pump body must be filled with liquid before starting motor. Air must be vented from the system by means of an air vent located at a high point in the system.

**Maintenance:**

**WARNING** Make certain that the unit is disconnected and locked out from the power source before attempting to service or remove any components.

1. System must be drained or pump isolated by turning off suction and discharge valves before attempting to remove pump.

**WARNING** Water temperature in system cannot exceed 90° F (32°C) before removing or servicing pump. If draining system leave drain valve open during servicing.

**CAUTION** Pump surface temperature cannot exceed 90°F (32°C) before removing or servicing pump.

**WARNING** Loosen flange bolts slightly and shift pump side to side to vent internal pump casing pressure before removing or servicing pump.

2. Remove pump from the system by removing four flange mounting bolts, nuts and washers (Ref. Nos. 24 & 25).

**REMOVAL OF MOTOR**

(Refer to Figure #1 for part identification) Motor may be removed from pump and replaced without draining and removing the entire pump. If motor troubles are a result of shaft seal failure, the shaft seal must be replaced before installing a replacement motor. See Shaft Seal Replacement section of this manual.

1. Lock out and disconnect power supply.
2. Remove four bolts (Ref. No. 3) fastening motor (Ref. No. 1) to adapter (Ref. No. 2).
3. Slide motor from adapter and stub shaft (Ref. No. 6). Remove square key (Ref. No. 5).

**INSTALLATION OF NEW MOTOR**

1. Apply anti-seize compound to motor shaft bore in stub shaft.
2. Position square key in motor shaft bore Keyway of stub shaft.
3. Align motor shaft Keyway with square key.
4. Slide motor into stub shaft until motor mounting face is contacting adapter face.
5. Install four motor mounting bolts.

**SHAFT SEAL REPLACEMENT  
REMOVAL OF OLD SEAL**

**IMPORTANT:** Always replace both seal seat (Ref. No. 11) and seal head (Ref. No. 12) to ensure proper mating of components! Also, impeller seals (Ref. Nos. 14 and 17) should be replaced anytime impeller (Ref. No. 16) has been removed.

1. Remove fasteners (Ref. No. 4) connecting casing (Ref. No. 20) to adapter (Ref. No. 2).
2. Slide casing off of seal plate (Ref. No. 10) locating boss. Take care when removing casing, it may be heavy.
3. Use a hex wrench to remove impeller fastener (Ref. No. 18). Remove impeller (Ref. No. 16) from stub shaft (Ref. No. 6).
4. Remove shaft sleeve (Ref. No. 13) from stub shaft. Remove old seal head from shaft sleeve.
5. Disconnect any piping or venting apparatus attached to seal plate 1/8" NPT wash/vent port.
6. Remove seal plate (Ref. No. 10) from adapter.
7. Remove shaft washer (Ref. No. 8) from stub shaft.
8. Inspect exposed sealed ball bearing. If bearing is worn or has been exposed to liquid that has leaked from inside pump, the bearing must be replaced. See Shaft Bearing Replacement section of this manual.
9. Pry seal seat from cavity in seal plate.

**INSTALLATION OF NEW SEAL**

**CAUTION** *The precision lapped faces on mechanical seal are easily damaged. Handle your repair seal carefully. Do not touch polished seal faces.*

**IMPORTANT:** Be sure that shaft does not damage polished seal faces.

1. Thoroughly clean all surfaces of seal cavity in seal plate.
2. Using a clean cloth, wipe shaft sleeve and make certain that it is clean.
3. Wet rubber portion of new seal seat with a light coating of soapy water. Using a clean rag, press seal seat squarely into seal plate seal cavity. Use cardboard washer (usually supplied with new seal), place over polished seal surface and use a piece of pipe or dowel rod to press seat in firmly but gently. Avoid scratching polished face.
4. Dispose of cardboard washer. Check again to see that polished face is free of dirt and all other foreign particles and that it has not been scratched or damaged.
5. Install shaft washer onto stub shaft.
6. Install seal plate onto stub shaft, align seal plate on shaft bearing, align 1/8" NPT seal wash/vent port with opening in adapter. Seat seal plate firmly against adapter.
7. Install shaft sleeve onto stub shaft until it bottoms against shaft washer.
8. Wet inside rubber portion of new seal head with a light coating of soapy water. Slide head onto shaft sleeve with sealing surface facing seal seat. Push head onto shaft sleeve until it lightly touches the seal seat. Make sure seal head spring is in position.
9. Install impeller seal (Ref. No. 14) into machined counter-bore in impeller hub. Install impeller seal (Ref. No. 17) into machined counter-bore in impeller nose.
10. Apply anti-seize compound to impeller hub shaft bore.
11. Position square key (Ref. No. 15) in impeller hub shaft bore Keyway.
12. Align stub shaft keyway with square key. Install impeller on stub shaft compressing seal head spring.
13. Install impeller fastener through impeller nose into stub shaft. Tighten with hex wrench. Make certain impeller is fully seated against shaft sleeve end.
14. Check if shaft turns freely by spinning the impeller.
15. Place casing seal on seal plate locating boss. Slide casing onto seal plate.
16. Attach casing using fasteners. Spin motor shaft to check for interference with casing.

**NOTE:** A short "run-in" period may be necessary to provide completely leak-free operation.

**CAUTION** *Seal will produce minor drag when spinning motor shaft, but rubbing anywhere else must be eliminated! Otherwise, damage to pump and/or motor may occur.*

**SHAFT BEARING REPLACEMENT**

Pump is constructed with a bearing supported stub shaft to allow removal of motor without draining pump casing. Bearing is a permanently lubricated sealed ball bearing. If bearing is worn or is exposed to liquid, from a leaking shaft seal for instance, it must be replaced.

**REMOVAL OF OLD SHAFT BEARING**

1. Follow steps 1 through 8 in REMOVAL OF OLD SEAL section.
2. Remove fasteners (Ref. No. 3) holding adapter (Ref. No. 2) to motor (Ref. No. 1).
3. Remove adapter, stub shaft, and bearing sub-assembly from motor.
4. Remove stub shaft/bearing sub-assembly from adapter.
5. Remove bearing from stub shaft.

**INSTALLATION OF NEW SHAFT BEARING**

1. Position new bearing onto stub shaft. Press squarely onto stub shaft until bearing bottoms against shoulder.
2. Position stub shaft/bearing sub-assembly onto adapter bearing bore. Press squarely into bearing bore until bearing bottoms.
3. Apply anti-seize compound to motor shaft bore in stub shaft.
4. Position square key (Ref. No. 5) in stub shaft motor bore keyway.
5. Align motor shaft keyway with square key. Install stub shaft/bearing adapter sub-assembly onto motor until adapter is fully seated against motor face.
6. Secure adapter to motor with fasteners.
7. Follow steps 5 through 16 in INSTALLATION OF NEW SEAL section.

**Repair Parts List (Motor)**

Ref. No.	Description	1/3 HP	1/2 HP	3/4 HP	1 HP	1.5 HP	2 HP
1	Motor 115/230 VAC, 1 PHASE	1626-005-00	1626-029-00	1626-006-00	1626-030-00	1626-095-00	1626-033-00
	Motor 230/460 VAC, 3 PHASE	1626-021-00	1626-031-00	1626-022-00	1626-032-00	1626-039-00	1626-034-00

**Repair Parts List (Impeller Kit)**

Ref. No.	Description	5864, 5865	5862, 5863	5860, 5861	5874, 5875	5872, 5873	5870, 5871	5886, 5887	5884, 5885	5882, 5883	5880, 5881
15,16 & 18	<b>Impeller Kit</b> includes 3/16 x 1/2" Sq. Key, Impeller, & Impeller Screw	5864-010-97	5862-010-97	5860-010-97	5874-010-97	5872-010-97	5870-010-97	5886-010-97	5884-010-97	5882-010-97	5880-010-97

**Repair Parts List (General)**

Ref. No.	Description	586 series cast iron	586 series cast bronze	587 series cast iron	587 series cast bronze	5886-95 & 5887-95	5886-97 & 5887-97	5880-95 thru 5885-95	5880-97 thru 5885-97	Qty
2, 3	<b>Adapter Kit</b> , Includes (4) 3/8-16 x 1" Bolts	5860-030-95	5860-030-95	5860-030-95	5860-030-95	5860-030-95	5860-030-95	5860-030-95	5860-030-95	1
5,6,7 & 8	<b>Stub Shaft Kit</b> , includes 3/16 x 1/2 Sq. Key, Stub Shaft, bearing & washer	5860-140-90	5860-140-90	5860-140-90	5860-140-90	5860-140-90	5860-140-90	5860-140-90	5860-140-90	1
7	Bearing #6007	3354-193-00	3354-193-00	3354-193-00	3354-193-00	3354-193-00	3354-193-00	3354-193-00	3354-193-00	1
9,10	<b>Seal Plate Kit</b> w/ 1/8" NPT Pipe Plug	5860-020-95	5860-021-97	5860-020-95	5860-021-97	5860-020-95	5860-021-97	5860-020-95	5860-021-97	1
11,12, 13, 14, 17, 19	<b>Seal Kit</b> includes Seal Seat, Seal Head, Shaft Sleeve, Sleeve O-ring, Impeller O-ring & Casing O-ring	5860-300-90	5860-300-90	5860-300-90	5860-300-90	5860-300-90	5860-300-90	5860-300-90	5860-300-90	1
20, 21 & 4	<b>Casing Kit</b> w/(5) 1/8" NPT Pipe Plugs & (4) 3/8-16 x 1.5" Bolt w/ Lock washer	5860-001-95	5860-002-97	5870-001-95	5870-002-97	5870-001-95	5870-002-97	5880-001-95	5880-002-97	1
22	<b>Flange Gasket Set</b> (2)	5860-301-90	5860-301-90	5860-301-90	5860-301-90	5860-301-90	5860-301-90	5860-301-90	5860-301-90	1
23, 24 & 25	<b>Flange Kit</b> Includes (2) Flanges, (4) fasteners & (4) nuts	5860-080-95	5860-080-97	5860-080-95	5860-080-97	5860-080-95	5860-080-97	5860-080-95	5860-080-97	1

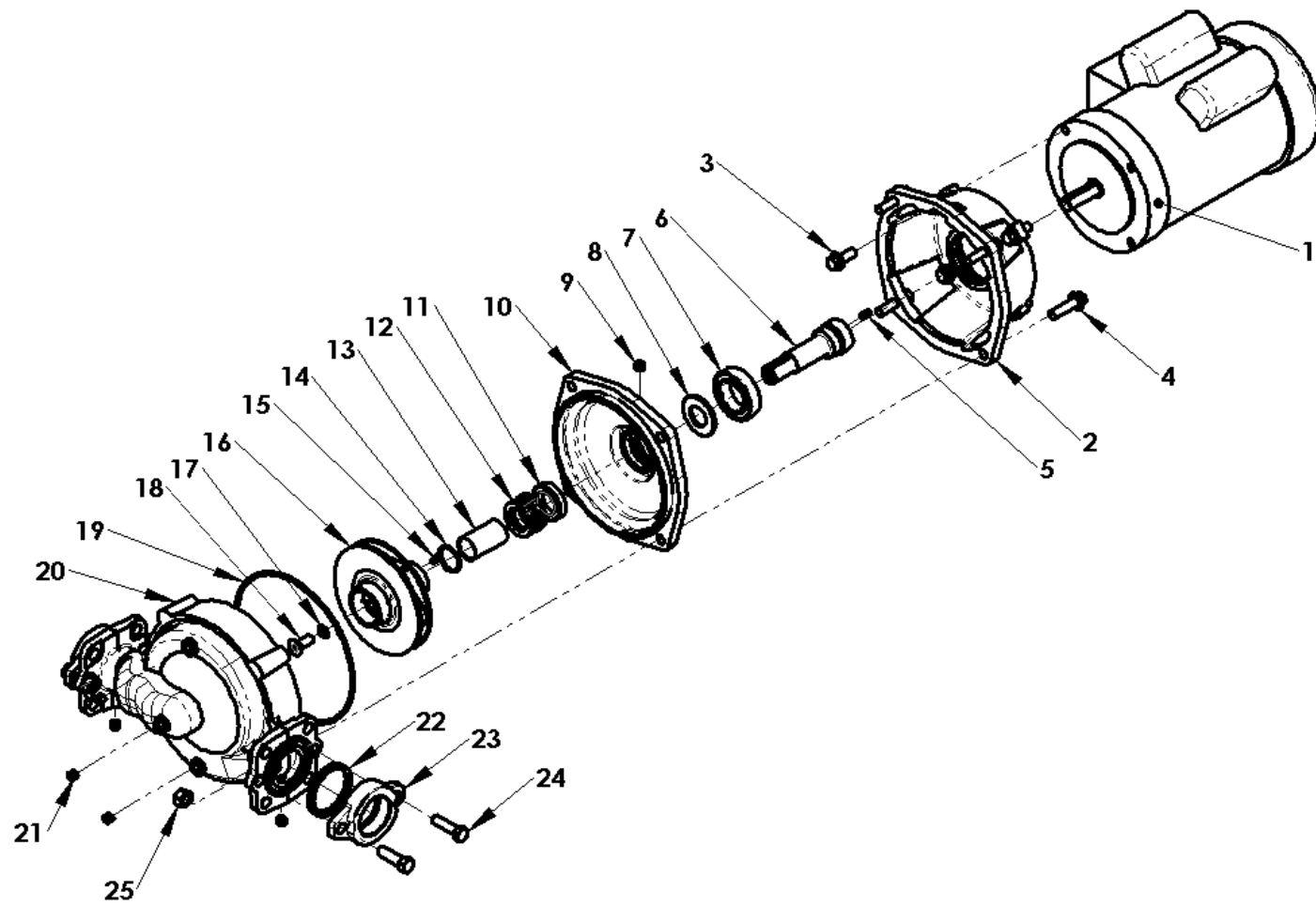


Figure 1 - Repair Parts Illustration

**PUMP PIPING:**

- Proper system design and installation by a qualified engineer is recommended.
- Always start piping from pump.
- Use as few bends as possible and preferably long radius elbows.
- Do not use flexible connectors on the suction or discharge of a vertical in-line pump unless the pump is rigidly mounted to a foundation.
- Ensure piping exerts no strain on pump as this could distort the casing causing breakage or early failure due to pump misalignment.
- All connecting pipe flanges must be square to the pipework and parallel to the pump flanges.
- Eliminate all air pockets that may prevent the pump from operating effectively.
- In open systems, test suction line for air leaks before starting; this becomes essential with long suction line or static lift.
- Install valves in both suction and discharge lines to assist with pump inspection or repair. Suction line valve may be opened completely during operation.
- Install a non-slam non-return check valve in discharge line between pump and isolation valve to protect pump from excessive back pressure and to prevent water running back through the pump on open systems.
- Before starting pump, the system must be thoroughly cleaned, flushed and drained and replenished with clean liquid.
- Welding slag and other foreign materials, improper or excessive water treatment are all detrimental to the pump internals and sealing arrangement and void warranty.
- Proper operation cannot be guaranteed if the above conditions are not adhered to.

**NOTE: INSPECT THE FOLLOWING BEFORE PUTTING PUMP INTO OPERATION:**

- Pump primed; liquid in pump.
- Rotation.
- System piping and pump properly supported.
- System clean of all debris.
- Proper electrical connections. Consult qualified electrician with any questions.