

*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.*

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

Refer to form L-4082 for General Operating and Safety Instructions and Applicable Warranty.

## Description

SHURflo 316 stainless steel, self-priming, positive-displacement, flexible impeller pumps provide a nearly pulseless flow with no metal-to-metal contact. Features 316 stainless steel pump body (impregnated with Teflon®), cover and wear plates, stainless steel shaft, Viton mechanical-type seal and o-rings with Nitrile impellers. Models have built-in cam profile for extended impeller life, concave manifold protects the impeller from intermittent dry run damage and increased startup suction lift. Mounted directly to NEMA frame AC Totally-Enclosed Fan-Cooled (TEFC) motors using an easy-installation package, or as pump heads only for custom installations. Single-phase motors are thermally-overload protected.

Uses: Handle a wide range of industrial, marine, agricultural and commercial applications where non-abrasive fluids compatible with pump wet-end construction component materials are pumped. Pumps are suitable for the transfer of non-lubricating fluids, mild abrasives, fluids containing small particles in suspension, and a wide variety of viscous fluids such as petroleum-based oils, silicone greases, and hydraulic fluids. The portable transfer units are ideal for water drainage transfer, barrel emptying, machine coolant recycling, and an assortment of related utility activities.

**NOTE:** Flexible impeller failure will occur immediately if pump is run dry, and this is not covered under warranty. Use caution to not touch the pump if you have dry run it, because it will be extremely hot.

- Pumps are supplied with 56C face motors and totally-enclosed fan-cooled (TEFC) construction.
- Capacities up to 22.8 GPM at 1725 RPM.
- Maximum discharge pressure is 25 PSI (60 ft. of head).
- Max. RPM: 3450 (1725 with supplied motors).
- Suction lift to 12 ft.
- Features 316 stainless steel pump body (impregnated with Teflon®), cover and wear plates, stainless steel shaft, Viton mechanical-type seal and o-rings with Nitrile impellers. Models have built-in cam profile for extended impeller life, concave manifold protects the impeller from intermittent dry run damage and increased startup suction lift.
- Maximum viscosity for pumps with standard electric motors up to 500 SSU and 25 PSI (60 ft. of head) at 1725 RPM or run at reduced speeds to handle a wide range of pump fluid viscosities (up to 2500 SSU) and specific gravity (up to 1.3). DO NOT pump oils or petroleum derivatives with optional neoprene impellers. (Maximum torque loads are found in the performance chart.)
- Pumps can operate bi-directionally (reversible).
- Temperature range with Nitrile impellers is 0°F - 180°F (optional neoprene impeller is 15°F - 130°F).
- NPT ports (3/4" to 1 1/4").
- Accessory NPT ports (1/8") for priming, vacuum switch (pump protector) installation (to allow for dry run protection) or pressure gauge installation.

**316 STAINLESS STEEL MODELS** – Excellent for water-based fluids. Features 316 stainless steel pump body (impregnated with Teflon®), cover and wear plates, stainless steel shaft, Viton mechanical-type seal and o-rings with Nitrile impellers. Wet-end parts are constructed from 316 stainless steel, Teflon®, Viton, carbon, ceramic and Nitrile.

**REPAIR IMPELLERS AND OPTIONS** – Standard impellers are Nitrile, and they and the optional neoprene impeller can be located in the repair parts list pages in this manual.

Optional Close-Coupled Gear Speed Reducers are available that mount directly between pump and motor to reduce pump speed for high viscosity or high specific gravity applications (See Appendix 2).

**NOTE:** Bronze flexible impeller pumps are also available as pedestal models or close-coupled for custom installation. Pedestal models are not equipped with motors.



**WARNING:** Do not use to pump flammable or explosive fluids such as gasoline, fuel oil, kerosene, etc. Do not use in flammable and/or explosive atmospheres. When pumping hazardous or dangerous materials, use only in a room or area designated for that purpose. For your protection, always wear proper clothing, eye protection, etc. in case of any malfunction. For proper handling techniques and cautions, contact your chemical supplier, insurance company and local agencies (fire dept., etc.). Failure to comply with this warning could result in personal injury and/or property damage.

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

## Model Ordering Codes and Options



Example Model: MRS9901

	(1) M	(2) R	(3) S	(4) 9 9	(5) 0	(6) 1
1st	2nd	3rd	4th	5th	6th	
Mounting	Type	Material	Impeller Size (Ports)	Impeller Material	AC Motor Options*	
M: Motor Mount	R: Flexible (Rubber) Impeller	S: 316 Stainless Steel	90 (3/4") - 3/4 HP 99 (1") - 1 HP 150 (1¼") - 1½ HP	0: Nitrile 1: Neoprene	0: Pump only 1: 1725 RPM 2: 3450 RPM	

**NOTE:** Not all order code combinations (configurations) are standard models available from the manufacturer. Custom model configurations may require ordering standard components and/or optional parts that will need to be assembled by the customer. Manufacturer reserves the right to change model order codes, standard models, specifications, and performance without notification. Standard motor speed is 1725 RPM. Maximum motor speed is 3450 RPM.  
(\*) Standard motors are single phase, 1725 RPM, totally-enclosed fan-cooled.

# Models MRS9000, MRS9001, MRS9900, MRS9901, MRS15000 and MRS15001

## Performance (with Water)

GPM Pumping Water at 70° F @ Total Feet of Head													
Model	Port Size*	HP	Max. Input Torque in.-lbs.	RPM	Suction Lift**	Free Flow	10	20	30	40	50	60 <sup>†</sup>	
Models with Motors													
MRS9001	3/4	3/4	28	1725	8	7.4	7.1	6.7	6.2	5.5	4.8	3.8	
MRS9901	1	1	37	1725	10	11.9	11.6	10.5	10.0	8.6	6.7	4.8	
MRS15001	1¼	1½	55	1725	12	22.8	21.2	20.9	20.0	19.0	17.1	14.3	
Models without Motors													
MRS9000	3/4	3/4	28	1725	8	7.4	7.1	6.7	6.2	5.5	4.8	3.8	
MRS9900	1	1	37	1725	10	11.9	11.6	10.5	10.0	8.6	6.7	4.8	
MRS15000	1¼	1½	55	1725	12	22.8	21.2	20.9	20.0	19.0	17.1	14.3	

Test data taken with water at 70° F (to convert data to PSI, divide feet of head by 2.31).

Pump performance when pump is new. As pump wears, the performance will decrease.

(†) Extended operation beyond 60 feet of head will result in immediate impeller failure.

(\*) Female NPT inlet and outlet (in inches).

(\*\*) Suction lift requires wetted impellers and seal chamber.

**NOTES:** Consult tables on HP adders and speed recommendations for high viscosity fluids. The pump relationship between volume (GPM), pressure (PSI), speed (RPM) and horsepower is shown on Performance Chart in Shurflo Motor Manual form L-4082. When pumping a more viscous liquid, a slower speed, a larger pipe size pump, and possibly a larger motor should be selected.

Max. Viscosity = 500 SSU at 1725 RPM with the motor supplied (at 1.0 specific gravity).

Max. Input Torque = see chart above.

Max. RPM = 3450

Max. Specific Gravity = 1.0 at 25 PSI, up to 1.3 at lower PSI & viscosity.

Do not use Neoprene impellers with oil.

Manufacturer reserves the right to change performance without notification.

## Specifications

													PUMP CONSTRUCTION (Wet End)						Ship Wt. (lbs.)	
Model	Motor HP	AC Motor Type	NEMA Frame	Motor Voltage	Amps	PH	HZ	Overload Protection**	Motor RPM	Pump Shaft Size	Motor Shaft	Motor Adapter	Port Size (in.)	Pump Body & Cam	Flexible Impeller ***	Wear Plates	Shaft	Seal & O-Rings*		
Models with Motors																				
MRS9001	3/4	TEFC	56C	115/230	10.8/5/4	1	60	Yes	1725	5/8 Keyed	5/8 Keyed	CI	3/4	316 SS	Nitrile	316 SS	316 SS	Viton	44	
MRS9901	1	TEFC	56C	115/230	12.8/6.4	1	60	Yes	1725	5/8 Keyed	5/8 Keyed	CI	1	316 SS	Nitrile	316 SS	316 SS	Viton	45	
MRS15001	1½	TEFC	56C	115/230	17.2/8.6	1	60	Yes	1725	5/8 Keyed	5/8 Keyed	CI	1½	316 SS	Nitrile	316 SS	316 SS	Viton	59	
Models without Motors																				
MRS9000	-	-	-	-	-	-	-	-	-	5/8 Keyed	-	-	3/4	316 SS	Nitrile	316 SS	316 SS	Viton	5	
MRS9900	-	-	-	-	-	-	-	-	-	5/8 Keyed	-	-	1	316 SS	Nitrile	316 SS	316 SS	Viton	6	
MRS15000	-	-	-	-	-	-	-	-	-	5/8 Keyed	-	-	1½	316 SS	Nitrile	316 SS	316 SS	Viton	7	

SS = Stainless Steel CI = Cast Iron TEFC = Totally-Enclosed Fan-Cooled

(\*) Viton mechanical seals have 316 Stainless Steel series components and carbon and ceramic wear surfaces.

(\*\*) Manual or Automatic - Check motor supplied.

(\*\*\*) Impeller has a 316 Stainless Steel insert.

**NOTES:** Driver data is subject to change without notice; see label on driver for actual information.

All dimensions in inches unless otherwise specified.

To prevent dry run operation, a vacuum switch (pump protector) is recommended.

Manufacturer reserves the right to change specifications without notification.

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

## Dimensions

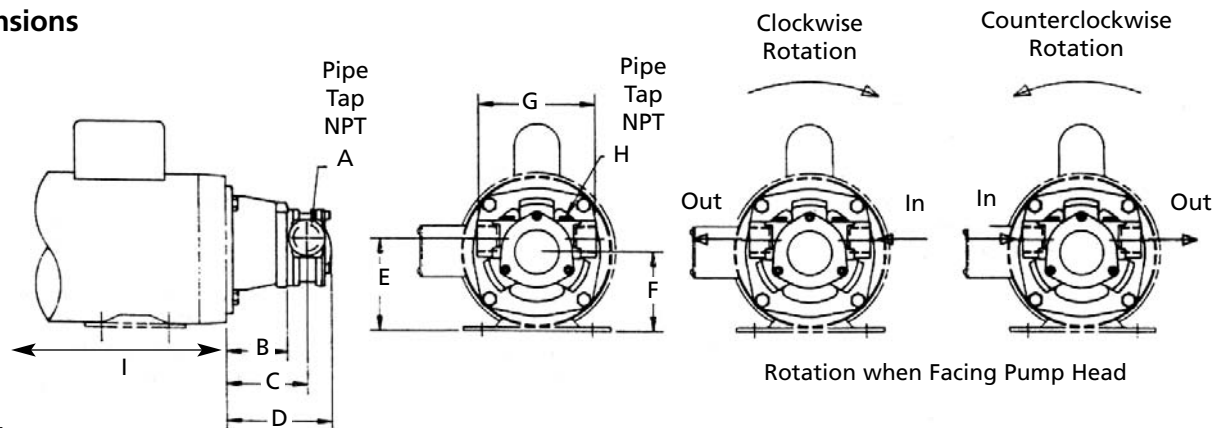


Figure 1

Model	A*	B	C	D	Dimensions (in inches)		G	H***	I**
					E	F			
Models with Motors									
MRS9001	3/4	2.80	3.47	4.32	4.07	3.50	5.76	1/8	9.25
MRS9901	1	2.80	3.66	4.70	4.07	3.50	5.76	1/8	9.75
MRS15001	1¼	2.80	4.03	5.44	4.07	3.50	5.76	1/8	10.75
Models without Motors									
MRS9000	3/4	2.80	3.47	4.32	4.07	3.50	5.76	1/8	-
MRS9900	1	2.80	3.66	4.70	4.07	3.50	5.76	1/8	-
MRS15000	1¼	2.80	4.03	5.44	4.07	3.50	5.76	1/8	-

(\*) Standard NPT (female) pipe thread. Inlet and outlet (in inches).

(\*\*) Electric motor dimensions may vary due to manufacturing specifications. Standard motors are NEMA 56C Totally-Enclosed Fan-Cooled type with NEMA base.

(\*\*\*) Standard NPT (female pipe thread) accessory and prime ports on inlet and outlet (in inches).

**NOTE:** All dimensions have a tolerance of (+ or -) 1/8".

Manufacturer reserves the right to change dimensions without notification.

## Impeller Identification Chart

Impeller Part Number	Material	(Dimensions in inches)		Hole Dia.	Key slot	Number of Blades
		Outside Dia.	Width			
09000S	Neoprene	2.45	0.88	0.63	0.18	12
09959S	Neoprene	2.45	1.25	0.63	0.18	12
15000S	Neoprene	2.58	2.00	0.63	0.18	12
21235S	Nitrile*	2.45	0.88	0.63	0.18	12
21251S	Nitrile*	2.45	1.25	0.63	0.18	12
21236S	Nitrile*	2.58	2.00	0.63	0.18	12

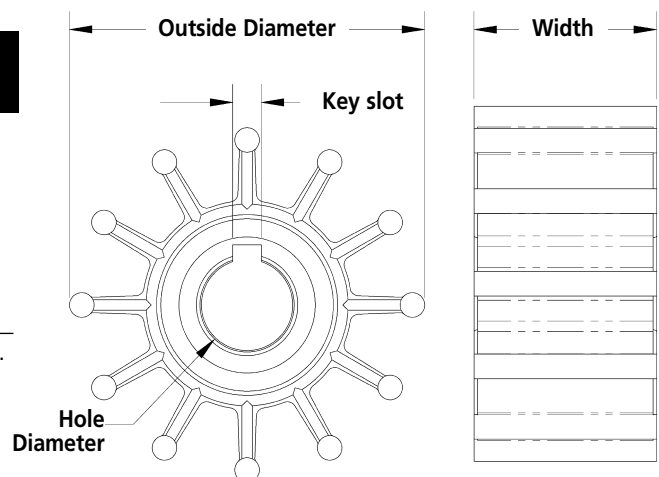
Refer to repair parts list pages in this manual to match up impeller with pump model.

(\*) Nitrile is standard and is equivalent to Buna-N. Nitrile is suggested for pumping oil-based fluids, and Neoprene is suggested for pumping water-based fluids.

**NOTES:** Dry running will result in immediate failure of impeller and cause extreme pump temperature (do not handle pump when hot).

Impeller damage is not covered under warranty.

Manufacturer reserves the right to change dimensions without notification.



# Models MRS9000, MRS9001, MRS9900, MRS9901, MRS15000 and MRS15001

## **⚠ WARNING**

*Check motor.  
It may be equipped*

*with an automatic resetting thermal protector and may restart unexpectedly (see specifications chart). Protector tripping is an indication of motor overloading as a result of operating the pump at too high a pressure (over 25 PSI or 60 feet of head), too high of viscosity, too high of specific gravity, excessively high or low voltage, inadequate wiring, incorrect motor connections, too small a motor (sized incorrectly, not enough HP), or a defective motor or pump.*

*Do not handle pump with wet hands or when standing in water. Failure to follow the General Safety Information and all warnings could result in fatal electrical shock!*

## Installation

**IMPORTANT:** In any installations where property damage and/or personal injury can occur when the pump is not operating due to power outages, discharge line freezing, or any other reason, a back-up system(s) and/or warning system(s) should be used.

In order to safely use this product, familiarize yourself with this pump and also with the liquid (chemical, etc.) that is going to be pumped through the unit. This pump is not suitable for many liquids.

1. Locate the pump as close to the liquid source as possible, making the suction line as short and direct as possible.

## PIPING

### SUCTION

2. Avoid excessive lengths or number of fittings and bends in the suction line.
3. Attach suction line to suction inlet (See Figure 1 for proper rotation).

**NOTE:** An optional vacuum switch (pump protector) is recommended to prevent pump dry run. It should be mounted on the suction side of the pump. Refer to installation/operation

instructions provided with vacuum switch (See Figure 2).

Figure 2 - Vacuum Switch Installation



4. It is recommended that same size pipe as pump ports be used or, in cases requiring lengthy piping, the next larger size pipe be used.
5. If suction level is greater than what is indicated in the performance chart, attach a foot valve below liquid level at end of suction line to ensure positive priming. Also note: If fluid specific gravity is greater than 1.0 or viscosity greater than 500 SSU, a foot valve is also recommended.

**NOTE:** If a foot valve (or check valve) is not used in the suction line, it may be necessary to refill the pump every time the unit is stopped and you wish to restart the pump. This depends on the length of time between starts and whether or not the impeller is wet enough to close cavities to affect a prime.

6. If solid contaminants are suspected in a liquid, place a filter in the suction line.
7. Be certain all suction piping connections are airtight.

**NOTE:** Assure airtight pipe connections with the use of a pipe joint sealant.

## DISCHARGE

8. Attach discharge piping to the discharge outlet.

## **⚠ WARNING**

*Support pump and piping during assembly and after installation. Failure to do so may cause piping to break, pump to fail, motor bearing failures, etc., all of which can result in property damage and/or personal injury.*

**NOTE:** Should the pump need to be self-draining, the pump head should be mounted in the vertical position with the suction port facing down. When pumping high viscosity fluids, the vertical position can be used with the suction port facing up and the pump mounted under the source. Increasing the suction pipe size and eliminating bends and elbows also assists in pumping high viscosity fluids. Max. viscosity is 500 SSU at 1725 RPM.

9. If a shut-off valve or handgun is required in discharge line, provide a pressure relief valve for pump protection.

## **⚠ WARNING**

*Shutting off discharge without providing pressure relief can cause extreme overpressure which can result in pump and/or motor failure. Do not exceed 25 PSI (or 60 feet of head) pump or system pressure.*

10. Operation under shut-off discharge conditions will overheat and damage pump and impeller.

**NOTE:** Globe valve or other restrictive valves should not be used as shut-off mechanism as they are restrictive in nature and will seriously affect pump performance.

11. After all piping and controls (not supplied with unit) have been installed, unit is ready for operation.

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

## Operation

**⚠ WARNING** *Do not run pump dry, as permanent damage to the pump impeller, seal, pump housing and wear plates will result. Suction pressure should never be greater than the discharge pressure. Dry running will result in immediate failure of impeller and cause extreme pump temperature (do not handle pump when hot). Impeller damage is not covered under warranty.*

1. All pumps must be primed before start-up and filled with fluid (See Figure 3). Never operate a pump unless it is secured to a solid foundation and all safety shields are installed.

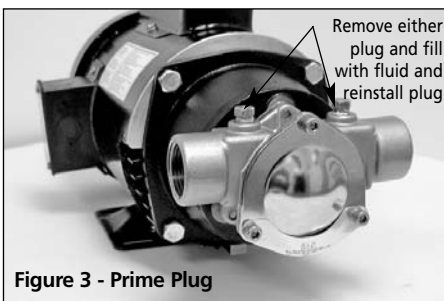


Figure 3 - Prime Plug

Upon start-up, maintain a minimum of 15 PSI (1 BAR) operating pressure on the pump. This will allow any remaining air to be driven from the seal chamber and will ensure liquid circulation to the seal.

2. Flexible impeller pumps are built to very close tolerances and this tolerance must not be altered. The liquids must, therefore, be free of all abrasives. Sand, silt, wettable powders, etc. must be avoided.
3. When pumping a more viscous (beyond 500 SSU) liquid; a slower speed, a larger pipe size pump, and possibly a larger motor should be selected.

**NOTE:** See performance chart for Max. Torque.

4. Recheck motor and pump rotation. Pump rotation is by-directional (See Figure 1).

## PRESSURE RELIEF VALVE

5. Standard models do not include a pressure relief valve. If discharge is going to be shut off, an external pressure relief valve should be installed.

## GEAR SPEED REDUCER OPTIONS

A gear reducer can be directly mounted between a standard pump and motor combination. Gear speed reducers are available for applications with high specific gravity, or when viscosities are greater than 500 SSU, using a standard 1725 RPM motor (See Appendix 2). The pump relationship between volume (GPM), pressure (PSI), speed (RPM), viscosity, specific gravity and horsepower is shown on performance chart in Shurflo Motor Manual form L-4082.

6. Unit is ready for operation.

## Maintenance

**⚠ WARNING** *Make certain that the power source is disconnected before attempting to service or disassemble any components!*

*If the power disconnect is out of sight, lock it in the open position and tag to prevent application of power.*

## CLEANING

Clean the suction line filter at regular intervals.

## ELECTRIC MOTOR

Properly selected and installed, electric motors are capable of operating for years with minimal maintenance. Periodically clean dirt accumulations from motors.

## GENERAL

Check the pump to motor shaft coupler alignment at regular intervals.

Periodically check that electrical connections are tight. Pump should be drained if placed in an area that is subject to freezing temperatures and should not be operated until temperature permits.

To store the pump, place a small quantity of light oil or some other storage preservative, compatible with your application, in the pump and rotate the shaft very slowly to work the oil throughout the gears and the body.

## PUMP REPAIR

### IMPELLER DISASSEMBLY

Refer to Figure 8.

**NOTE:** The impeller is a common wear item in this pump and frequent replacement is suggested. Impeller can become torn, distorted and overheated becoming brittle. When this happens, impeller blade fragments can come off the impeller and be pumped downstream or block pump ports or plumbing. It is not recommended to flip around a used/worn impeller for reinstallation. (See Appendix 1 for illustrations of common impeller problems.)

- 1a. Remove the three screws (Ref. No. 2) which hold the cover plate (Ref. No. 1), wear plate (Ref. No. 10) and o-ring (Ref. No. 11) to pump body (Ref. No. 3).
- b. The impeller (Ref. No. 12) can be removed using two pair of pliers to grip two of the impeller's vanes on opposite sides of the impeller (See Figure 4).



## Models MRS9000, MRS9001, MRS9900, MRS9901, MRS15000 and MRS15001



Figure 4 -  
Impeller  
Removal

c. Inspect drive key, cover and internal wear plates, pump body inside and cam for wear. If parts are worn, replace, as worn parts will cause poor pump performance including poor suction lift, discharge pressure and flow. If numerous components are worn, it's suggested to replace the complete pump head. (See Pump and Seal Disassembly section for further pump disassembly instructions.)

### IMPELLER ASSEMBLY

2a. Place some anti-seize compound on impeller shaft and key. Install the impeller (Ref. No. 12) over the drive shaft using a non-petroleum-based lubricant such as silicone or soapy water. The impeller is installed using a twisting motion in the same direction as motor rotation. The key slot of the impeller needs to line up with key on the drive shaft (See Figure 5).

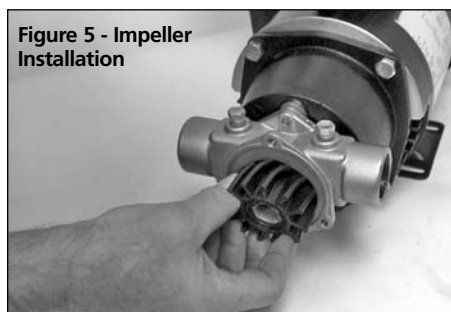


Figure 5 - Impeller  
Installation

b. Install o-ring (Ref. No. 11) into pump body housing groove, insert wear plate (Ref. No. 10) and put cover (Ref. No. 1) on pump body being sure not to pinch o-ring. Tighten the three screws (Ref. No. 2) to 36 in.-lbs.

**NOTE:** Wear plates (Ref. No. 10) can be flipped to create new wearing surfaces.

### PUMP AND SEAL DISASSEMBLY

3a. Remove impeller (Ref. No. 11) and drive key (Ref. No. 13). (See Impeller Disassembly.)

**NOTE:** The cam is not removable. If cam is worn, pump body replacement is required.

b. Remove the four bolts (Ref. No. 16) holding pump assembly to motor face. Pump assembly can now be readily removed from the motor.

c. Remove three screws (Ref. No. 6) which retain pump body (Ref. No. 3), o-ring (Ref. No. 11), motor adapter (Ref. No. 15), wear plate (Ref. No. 10) and seal retainer plate (Ref. No. 5). These parts will separate upon disassembly except for the seal seat and retaining ring.

d. Pry out seal retaining ring (Ref. No. 18), and press out seal seat (Ref. No. 8) from seal retaining plate (Ref. No. 5).

e. Seal (Ref. No. 7) can now be removed from pump shaft (Ref. No. 4). There is a spacing washer behind the seal that spaces the seal properly against the drive shaft collar. This spacer is included with a new seal and does not have a separate part number.

f. The pump drive shaft (Ref. No. 4), along with the drive shaft key (Ref. No. 14) and the shaft collar (Ref. No. 9), do not need to be removed from the motor unless worn, or motor needs replacement.

### PUMP AND SEAL ASSEMBLY

4a. If the pump drive shaft (Ref. No. 4) with the drive shaft key (Ref. No. 14) and the shaft collar (Ref. No. 9) were removed from motor, then reinstall in reverse order. Place some anti-seize compound on motor shaft and drive shaft key (Ref. No. 14). Slide the pump drive shaft (Ref. No. 4) over the motor shaft, aligning the key with the key slot, and push as far onto the motor as possible. Slide shaft collar (Ref. No. 9) over the pump shaft as far back as it will go. Align the collar set screw over the key in the pump drive shaft slot and tighten collar set screw, compressing the key to the motor shaft.

**NOTE:** Installing a new seal is always recommended when pump is disassembled to the point of seal removal. The precision carbon/ceramic faces on the mechanical seal are easily damaged. Handle your repair seal carefully. Do not touch the carbon/ceramic seal faces.

b. Thoroughly clean all surfaces of the seal seat cavity in seal retaining plate (Ref. No. 5).

c. Using a clean cloth, wipe the shaft and shaft sleeve and make certain that they are perfectly clean.

**NOTE:** Inspect the pump drive shaft for scratches or spiral grooves. If they exist, replace shaft.

d. Wet the rubber portion of the new seal seat (part of Ref. No. 8) with a light coating of soapy water. While wearing clean gloves or using a clean light rag, press seal seat squarely into seal retaining plate recess (Ref. No. 5). Use the cardboard washer (usually supplied with new seal) to place over the polished ceramic surface and use a piece of

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

## Maintenance (Continued)

pipe or dowel rod to press in firmly but gently. Avoid scratching the ceramic face, usually white (See Figure 6).



- e. Dispose of cardboard washer. Check again to see that ceramic surface is free of dirt and all other foreign particles and that it has not been scratched or damaged.
- f. Install seal retaining ring (Ref. No. 18) over seal seat (Ref. No. 8) into seal retaining plate (Ref. No. 5).
- g. Wet the inside rubber portion of the new seal (part of Ref. No. 7) with a light coating of soapy water. Slide seal spacer onto the pump drive shaft. Then slide the seal with

the precision sealing surface (carbon) facing the front of the pump drive shaft, which will match up with the seal seat ceramic face installed in the seal retaining plate (Ref. No. 5) (See Figure 7).



- h. Reinstall three screws (Ref. No. 6) which retain pump body (Ref. No. 3), o-ring (Ref. No. 11), motor adapter (Ref. No. 15), wear plate (Ref. No. 10) and seal retainer plate (Ref. No. 5). Make sure the o-ring (Ref. No. 11) and wear plate (Ref. No. 10) slide into the groove of the pump body, not pinching the o-ring.

**NOTE:** Wear plates (Ref. No. 10) and the pump body (Ref. No. 3) can be flipped to create new wearing surfaces.

- i. Pump assembly can now be readily reinstalled to the motor. Be careful not to damage the seal seat when sliding over the pump drive shaft. Reinstall the four bolts (Ref. No. 16) holding pump assembly to motor face. This completes seal installation.

- j. Install impeller (See Impeller Assembly).

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

- k. All pumps must be primed before start-up and filled with fluid (See Figure 3). Never operate a pump unless it is secured to a solid foundation and all safety shields are installed.

**⚠ WARNING** *Do not run pump dry, as permanent damage to the pump impellers, seal, pump housing and wear plates will result. Suction pressure should never be greater than the discharge pressure. Dry running will result in immediate failure of impeller and cause extreme pump temperature (do not handle pump when hot). Impeller damage is not covered under warranty.*



**To order parts, contact a SHURflo Distributor or Order Direct.**  
Distributors can be found at [www.shurfloindustrial.com](http://www.shurfloindustrial.com).

Please provide following information:

- Model number
- Serial number (if any)
- Part description and number as shown in parts list

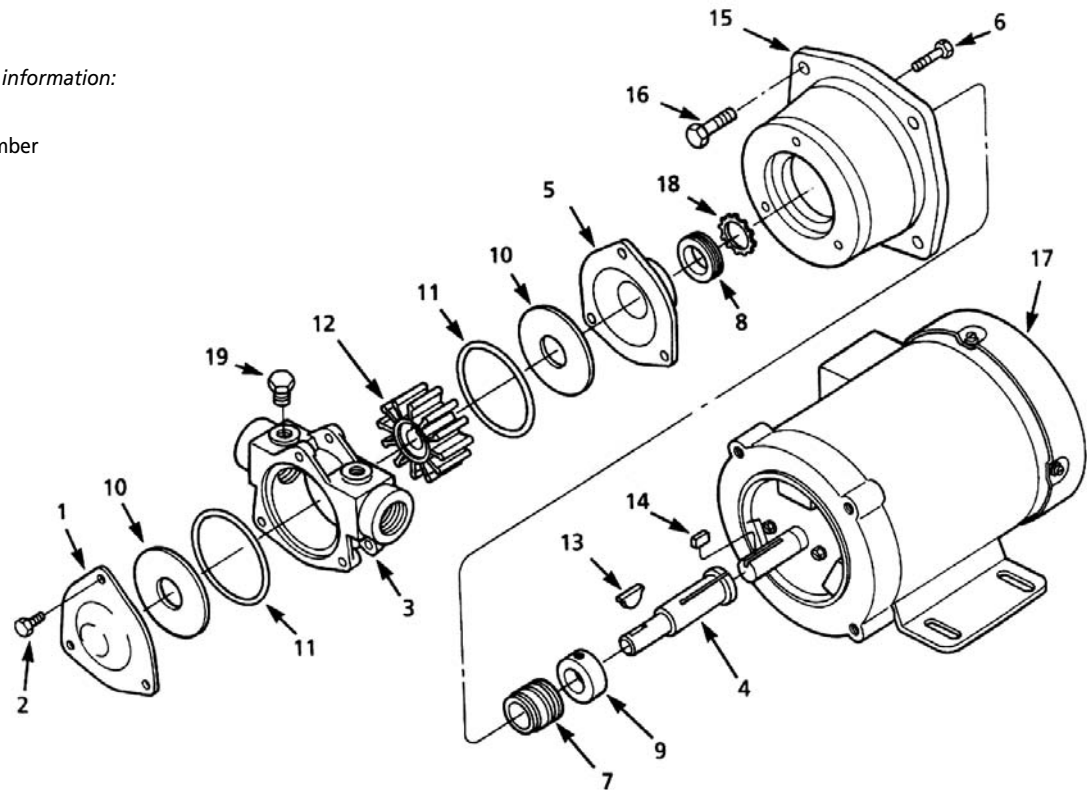


Figure 8 - Repair Parts Illustration

Ref. No.	Description	Part No. for Pump Models						Qty.
		MRS9001	MRS9901	MRS15001	MRS9000	MRS9900	MRS15000	
1	Cover Plate (316 Stainless Steel)	21483	21483	21483	21483	21483	21483	1
2	Screw	21769	21769	21769	21769	21769	21769	3
3	Housing (316 Stainless Steel)	21220	19994	21170	21220	19994	21170	1
4	Shaft (316 Stainless Steel)	19992	19992	21169	19992	19992	21169	1
5	Seal Retainer Plate (316 Stainless Steel)	21572	21572	21572	21572	21572	21572	1
6	Screw	21770	21770	21770	21770	21770	21770	3
7 & 8*	Mech. Seal & Shaft Assy. (Viton)	24457S	24457S	24457S	24457S	24457S	24457S	1
9	Shaft Collar	21239	21239	21239	21239	21239	21239	1
10	Wear Plate (316 Stainless Steel)	21500	21500	21500	21500	21500	21500	2
11	O-ring (Viton)	18079	18079	18079	18079	18079	18079	2
12	Impeller (Nitrile)	21235S	21251S	21236S	21235S	21251S	21236S	1
Optional	Impeller (Neoprene)	09000S	09959S	15000S	09000S	09959S	15000S	1
13	Impeller Key - Woodruff	12841	12841	12841	12841	12841	12841	1
14	Drive Shaft Key - Square	21597	21597	21597	21597	21597	21597	1
15	Mounting Adapter (Cast Iron)	21571	21571	21571	21571	21571	21571	1
16	Screw	22771	22771	22771	22771	22771	22771	4
17	Motor (TEFC Single-Phase)	21594S	21595S	21596S	-	-	-	1
18	Seal Retaining Ring	21771	21771	21771	21771	21771	21771	1
19	Pipe Plug (316 Stainless Steel)	24441	24441	24441	24441	24441	24441	2

TEFC = Totally-Enclosed Fan-Cooled

(\*) Mechanical seals have carbon ceramic wearing faces and 316 Stainless Steel spring components with Viton elastomers.

Manufacturer reserves the right to change parts without notification.

# SHURflo 316 Stainless Steel Close-Coupled Self-Priming Flexible Impeller Pumps

## Appendix 1 - Impeller Pump Inspection, Common Problems and Operation

Shurflo recommends replacing your impeller annually. Proper storage of the impellers during a prolonged lay-up can help maintain the life of the impeller.

Remove the impeller from the housing and store it in a cool, dark place. This will avoid the following:

- Copper bonding of the impeller to the housing
- Vanes "setting" into position as stored in the housing
- Ultraviolet deterioration

### Recommended inspection to be performed at any service interval:

Impeller . . . . . Inspect for cracks or tears. Also, inspect for excessive abrasion of vane ends. Replace annually or if any of the conditions exist (see picture).

Wear Plate . . . . . Inspect for wear, flatness, and pin for fatigue. Replace at minor and major pump rebuild or if wear is evident to maintain pump flow and suction performance.

Cam . . . . . Replace at major pump rebuild or if pitting/wear is evident.

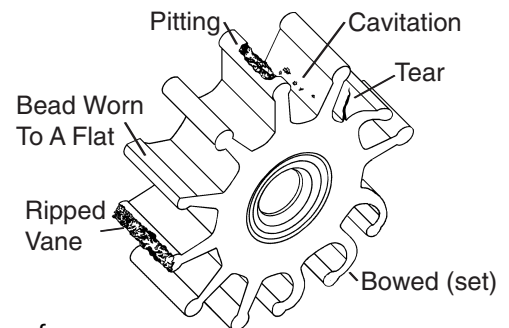
Cover . . . . . Replace at major pump rebuild or if wear exists to maintain pump flow and suction performance.

Mechanical Seal . . . . . Replace at minor and major pump rebuild or if leaking.

Lip Seal . . . . . Replace at minor and major pump rebuild or if leaking.

Shaft . . . . . Inspect for wear in area of lip seal and rubber impeller. Grooving of lip seal area or heavy fretting of the impeller end shaft will require shaft replacement.

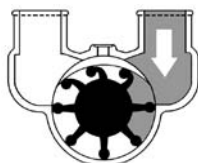
Bearing . . . . . Inspect for loss of grease, corrosion or rough rotation. Replace at major pump rebuild or if in doubt.



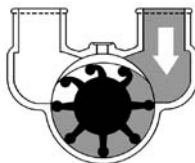
### Three tips to help you install your new Shurflo impeller:

- Use a non-petroleum-based lubricant (silicone or soapy water) to help slide the impeller into the housing.
  - Install the impeller with a twisting motion onto the shaft. Never force an impeller onto the shaft.
  - Impeller must be able to move freely on the shaft to properly prime and function.
- (Use a small amount of non-petroleum-based lubricant to help hold the o-ring or gasket when replacing the cover.)

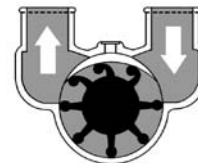
## Operation: How an Impeller Pump Works



**1** A self-priming vacuum is created as the flexible impeller vanes straighten upon leaving the cam, drawing liquid into the pump.



**2** The rotating impeller carries liquid from the inlet to the outlet port. As a consequence of their design, flexible impeller pumps can pass fairly large solids.



**3** When the flexible impeller vanes regain contact with the cam, they bend and the liquid is discharged from the pump in a uniform flow. Liquids can be pumped in the opposite direction by reversing the rotation of the pump.

# Models MRS9000, MRS9001, MRS9900, MRS9901, MRS15000 and MRS15001

## Appendix 2 - Optional C-Flanged Pump Speed Gear Reducers

### GEAR SPEED REDUCER OPTIONS

A gear reducer can be directly mounted between a standard pump and motor combination. Gear speed reducers are available for applications with high

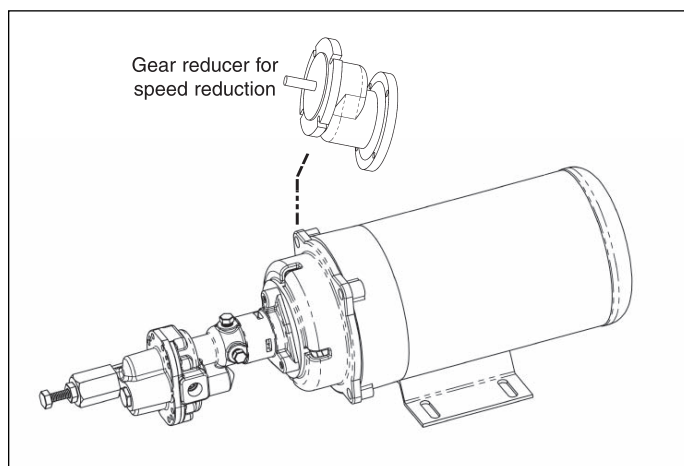
specific gravity, or when viscosities are greater than 500 SSU, using a standard 1725 RPM motor. The pump relationship between volume (GPM), pressure (PSI), speed (RPM), viscosity, specific

gravity and horsepower is shown on performance chart in Shurflo Motor Manual form L-4082.

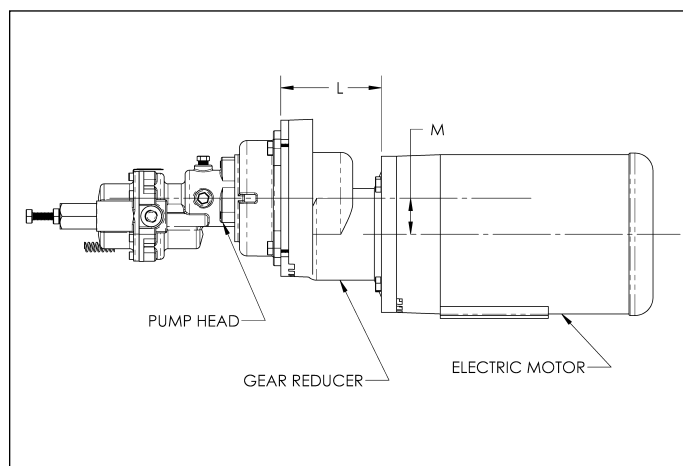
Model Number	Description	L*	M*	RPM Out**	Ship Weight (lbs.)
AGR56C600	Gear Reducer, 56C to 56C, 3.0 ratio	5.177	1.675	583	21
AGR56C900	Gear Reducer, 56C to 56C, 2.0 ratio	5.177	1.675	875	21
AGR56C1200	Gear Reducer, 56C to 56C, 1.5 ratio	5.177	1.675	1167	21

(\*) L dimension (in inches) is length of the gear reducer. M dimension (in inches) is the offset of the reducer output centerline from the motor centerline. All reducers may be rotated in 90° increments changing the orientation of the offset from top to side to bottom.

(\*\*) Based on 1750 RPM motor speed.



**Disassemble Pump From Motor and Insert Gear Reducer.** Illustration depicts gear pump but same principle applies to flexible impeller pumps.



**Gear Reducer Installed between Pump and Motor** (References L and M are dimensions in chart above.) Illustration depicts gear pump but same principle applies to flexible impeller pumps.

## This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

