



The Original Engine Cooling Pump Since 1921  
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## 27000 Pump Series Technical Guide

### Identification



**P2701-01, P2704-01,  
P2708-01**

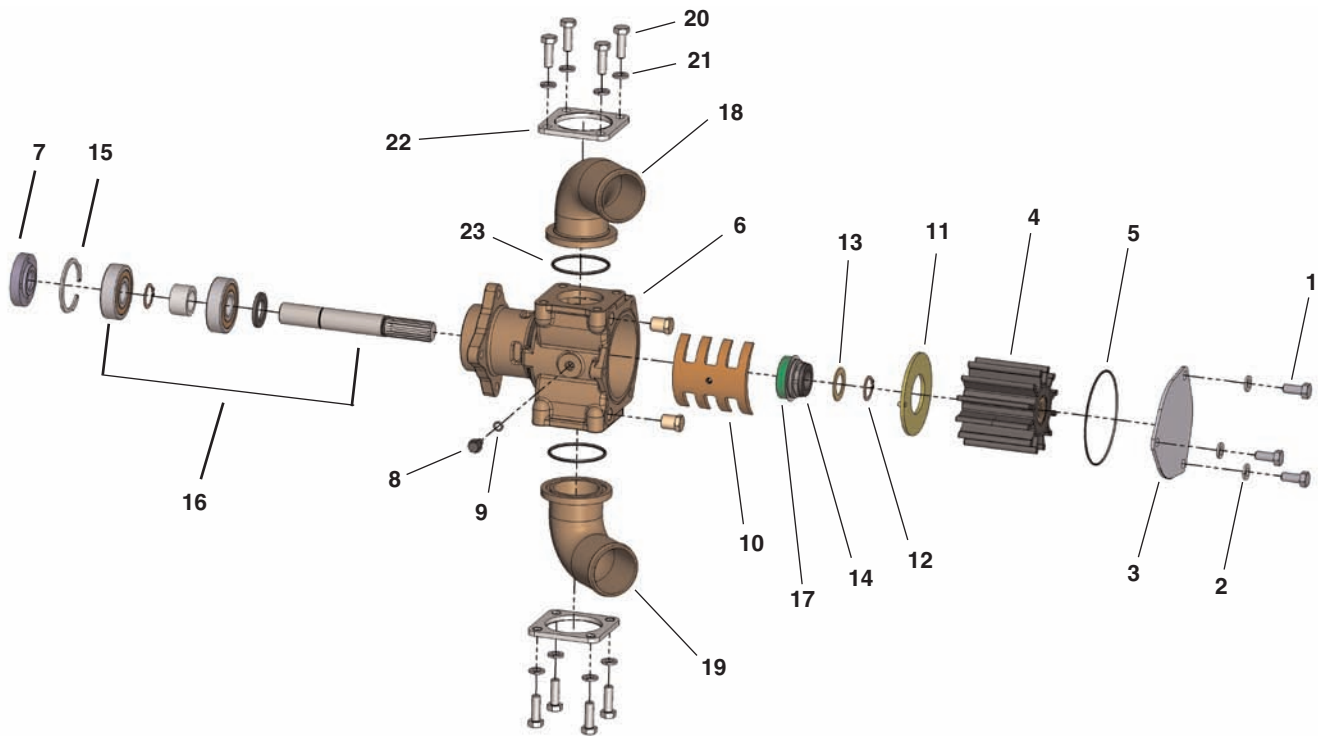


**P2703-01, P2705-01,  
P2709-01**



**P2701X, P2702-01,  
P2706-01, P2708X,  
P2710-01**

# Assembly / Disassembly Instructions



The following assembly/disassembly procedures apply to all 27000 Series pumps. Deviations from pump to pump are primarily a result of different methods of drive and mounting. Pump model numbers can be found stamped into the cover plate of the pump.

## Disassembly:

- A. Remove the three bolts (1) and lockwashers (2) from the pump cover (3). Note the direction of the impeller blades upon removal. Remove the impeller (4) using the appropriate 24412 or 25106 M16 x 1.5 impeller puller. Remove the o-ring (5) from the housing (6).
- B. Remove the pulley hub (7) from the shaft using a bearing puller.
- C. Remove the cam screw (8), cam screw o-ring (9), and cam (10). The internal wear plate (11) will drop out. For the P2701-P2706 models, the retaining ring (12), washer (13) and seal seat (14) can then be removed.
- D. From the ball bearing end, the internal snap ring (15) must be removed. The shaft bearing assembly (16) is pressed out of the body from the impeller end of the housing. For pump models P2708-P2710, the mechanical seal seat (14) is now loose inside of the housing and can be removed. The mechanical seal (17) may now be pressed from the bearing side of the housing (6).
- E. Removal of the port adapters (18/19) is not necessary under normal conditions. If needed, first note the angle of each port to be able to reassemble to the correct orientation. Remove the bolts (20) and lockwashers (21) from the port adapter bracket (22). Remove and inspect the o-rings (23) for damage.
- F. Inspect the shaft for heavy fretting of the spline portion that drives the impeller. Inspect the bearings for loss of grease, corrosion, and rough rotation. If the shaft or bearings exhibit such wear, replace the entire shaft and bearing assembly (16) listed below.

**Warning:** The new water seal kit 25115-SHW is designed to be used with newer pump designs P2708-01, P2708X, P2709-01, and P2710-01) or upgraded older pump designs using the new 25100-SHW shaft/bearing assembly that facilitates the new metal sleeve water seal. The 25115-SHW metal sleeve water seal cannot be used with the previous shaft and bearing assemblies. Doing so will cause damage to the shaft and the seal.

## Identifying the proper shaft for use with the 25115-SHW mechanical seal kit:

25100-SHW shaft/bearing assemblies do NOT have a retaining ring groove on the shaft in the area between the impeller and the first bearing (the bearing on the impeller end of the pump). These shaft and bearing assemblies can be used with the 25115-SHW. If a retaining ring exists between the impeller and the first bearing, do not use the 25115-SHW mechanical seal kit.

# Assembly / Disassembly Instructions (continued)

## Reassembly:

- A. Press mechanical seal (17) into housing (6) with the grey silicon carbide face of the mechanical seal toward the impeller cavity.
- B. Press the bearing and shaft assembly (16) into the housing (6) from the pulley end of the pump. Replace the internal snap ring (15).

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- C. For Models P2701-P2706, the grey silicon carbide seat and rubber cup (14) is now installed from the impeller end of the housing with the grey face of the seal seat contacting the grey mechanical seal (17) face. In pressing the seal seat, a pusher should be used with a diameter only slightly greater than the shaft diameter (.80"). Soapy water or a lubricant from a seal manufacturer may be used in assembly. Oil or grease must not be used as it will prevent the rubber cup from properly gripping the shaft. The seat and cup are pressed just beyond the external/snap ring groove. The seat should be inspected to ensure that the cup did not become partially dislodged during the press procedure. The washer (13) and external snap ring (12) are then installed.
- D. For Models P2708-P2710, use the seal installation tool provided in the mechanical seal, minor and major kits, to press the seal seat (14) to the correct position on the shaft. Place the seal seat in the seal installation tool with the grey silicon carbide face away from the tool and the metal backing cup inside the tool. Slide the seal seat and tool over the shaft from the impeller end of the pump. The seal seat is pressed onto the shaft until the seal installation tool contacts the metal edge of the mechanical seal case. This metal to plastic contact between the seal edge and the plastic seal installation tool ensures the proper seal compression. Because the seal seat is pressed onto the shaft, there is no need for a snap ring to hold the seal seat in place.
- E. The internal wear plate (11) is dropped in place with the anti-rotation pin aligned with the cast slot in the bottom of the housing. Replace the cam screw o-ring (9) on the cam screw (8), then the cam (10) can be reinstalled and secured with the cam screw. The cam screw should be inspected to ensure that it does not protrude below the cam. Should the screw protrude beneath the cam, replace it with a new screw, or grind flush. Failure to do so will result in immediate impeller damage.
- F. At this time, press on the pulley hub (7). The shaft bearing assembly (16) must be securely supported from the impeller end and in line with the press. Failure to do so will result in either damaged bearings and/or a canted pulley hub with excessive run out.
- G. Install the impeller (4) using a non-petroleum based lubricant such as silicone or soapy water. **Note:** Do not use petroleum-based fluids as they will damage the impeller. The impeller is installed using a twisting motion. Ensure the impeller blades are bent in the same direction as upon removal.
- H. Replace the o-ring (5), cover (3), lockwashers (2), and three bolts (1). Torque the cap screws to 14 ft-lbs. **Note:** If the cover is replaced with a new one, record the information on the original cover to help identify the pump for future repairs and maintenance.
- I. If necessary, place the o-ring (23) in the port adapters (18/19). Slide the port adapter bracket (22) onto the ports, then replace the lockwashers (21) and bolts (20) to secure the ports to the housing. Be sure to align the ports as they were prior to removal.
- J. After installation, inspect the pump seal, lip seal, body, housing, and cam areas for leaks.

## Assembly / Disassembly Instructions (continued)

	Sherwood #		P2701-01	P2701X	P2703-01	P2708-01	P2708X	P2709-01
			P2704-01	P2702-01 P2706-01	P2705-01		P2710-01	
Item		QTY						
1	Cap Screw	3	19626-SHW	19626-SHW	19626-SHW	19626-SHW	19626-SHW	19626-SHW
2	Lockwasher	3	15944-SHW	15944-SHW	15944-SHW	15944-SHW	15944-SHW	15944-SHW
3	Cover Plate	1	18742-SHW	18742-SHW	18742-SHW	18742-SHW	18742-SHW	18742-SHW
4	Impeller	1	27000-SHW	27000-SHW	27000-SHW	27000-SHW	27000-SHW	27000-SHW
5	O-ring	1	15945-SHW	15945-SHW	15945-SHW	15945-SHW	15945-SHW	15945-SHW
6	Housing	1	24161-SHW	24161-SHW	24161-SHW	24161-SHW	24161-SHW	24161-SHW
7	Gear Assy/Hub	1	24879-SHW	24879-SHW	24879-SHW	24879-SHW	24879-SHW	24879-SHW
8	Cam Screw	1	19714-SHW	19714-SHW	19714-SHW	19714-SHW	19714-SHW	19714-SHW
9	Cam Screw O-ring	1	19712-SHW	19712-SHW	19712-SHW	19712-SHW	19712-SHW	19712-SHW
10	Cam	1	18271-SHW	18271-SHW	18271-SHW	18271-SHW	18271-SHW	18271-SHW
11	Wear Plate-Pin Assy	1	24162-SHW	24162-SHW	24162-SHW	24162-SHW	24162-SHW	24162-SHW
12	Retaining Ring (Ext)	1/3	15952-SHW	15952-SHW	15952-SHW	15952-SHW	15952-SHW	15952-SHW
13	Washer	1	15959-SHW	15959-SHW	15959-SHW			
14/17	Mech Seal/Seat Assy	1	15955-SHW*	15955-SHW*	15955-SHW*	25115-SHW	25115-SHW	25115-SHW
15	Retaining Ring (Int)	1	15942-SHW	15942-SHW	15942-SHW	15942-SHW	15942-SHW	15942-SHW
16	Shaft/Bearing Assy	1	25100-SHW**	25100-SHW**	25100-SHW**	25100-SHW	25100-SHW	25100-SHW
18	Port	1	19236-SHW		19236-SHW	19236-SHW		19236-SHW
19	Port	1	19236-SHW		21988-SHW	19236-SHW		21988-SHW
20	Bolts	8	21484-SHW		21484-SHW	21484-SHW		21484-SHW
21	Lockwasher	8	21573-SHW		21573-SHW	21573-SHW		21573-SHW
22	Port Bracket	2	21373-SHW		21373-SHW	21373-SHW		21373-SHW
23	O-ring	2	21525-SHW		21525-SHW	21525-SHW		21525-SHW
	Minor Repair Kit		24580-SHW	24580-SHW	24580-SHW	25125-SHW	25125-SHW	25125-SHW
	Major Repair Kit		25126-SHW	25126-SHW	25126-SHW	25126-SHW	25126-SHW	25126-SHW

\* 15955-SHW is to be only used with the original shaft and bearing assembly. The original shaft and bearing assembly has a snap ring groove between the impeller and the first ball bearing. Do not use the 15955-SHW with the 25100-SHW shaft bearing assembly designed for the pressed-on seal seat.

\*\* When replacing the shaft bearing assembly with the 25100-SHW, the 25115-SHW mechanical seal kit must also be used. The 25100-SHW shaft and bearing assembly can be identified by the absence of the snap ring groove between the impeller and the first ball bearing. Do not use the 15955-SHW with the 25100-SHW assembly.

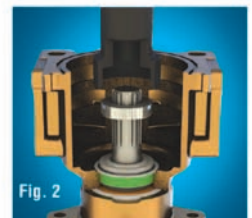
## 25115-SHW Seal Upgrade

### Disassembly

1. See the applicable pump technical guides L-3045 or L-3060 for the Pump Disassembly steps prior to the water seal removal.
2. Press the shaft and bearing assembly out of the pump from the impeller end and toward the engine side of the pump.
3. Discard the seal seat. Press the mechanical (spring loaded) seal out of the pump from the engine end and toward the impeller side of the pump. Discard the mechanical seal.

### Installation

1. See the applicable pump technical guides L-3045 or L-3060 for the steps prior to the two-piece water seal installation.
2. Clean the shaft seal seat area to remove any debris, salt buildup, or other corrosion to prevent the seal seat from galling on the shaft during installation.
3. Use the installation tool to press the mechanical (spring loaded) seal into the housing- mechanical seal is pressed to metal-to-metal contact with the housing (Fig. 1).
4. Use the installation tool to press the metal sleeve seal seat onto the shaft (Fig. 2).
5. The seal seat is in the proper position when the installation tool contacts the mechanical seal casing (Fig. 3).



# Preventative Maintenance

*The #1 reason for premature engine wear is overheating. To maintain engine performance, insist upon genuine Sherwood impellers and service kits.*

Maintenance Schedule	Pleasure Boating (Low Hours)		Commercial/Fishing Use (High Hours)	
	Light Duty	Severe Duty (High RPM, Silt or Sand)	Heavy Duty	Severe Duty (High RPM, Silt or Sand)
Impeller Kit	Every year	6 months	6 months	3 months
Minor Kit	2 years	Every year	Every year	6 months
Major Kit	4 years	2 years	2 years	Every year

	Impeller Kit 27000K-SHW	Minor Kit 24580-SHW	Minor Kit 25125-SHW	Major Kit 25126-SHW
	15945-SHW O-ring	15945-SHW O-ring	15942-SHW Retaining Ring	15942-SHW Retaining Ring
	27000-SHW Impeller	15952-SHW Retaining Ring	15945-SHW O-ring	15945-SHW O-ring
		15955-SHW Seal Assy	18271-SHW Cam	18271-SHW Cam
		27000-SHW Impeller	18742-SHW Cover	18742-SHW Cover
			19712-SHW O-Ring	19712-SHW O-Ring
			19714-SHW Cam Screw	19714-SHW Cam Screw
			21525-SHW (2) O-ring	21525-SHW (2) O-ring
			24156-SHW Slinger	24162-SHW Wear Plate
			24162-SHW Wear Plate	24412-SHW Impeller Puller
			24412-SHW Impeller Puller	25080-SHW Seal Assy
			25080-SHW Seal Assy	25100-SHW Shaft Bearing Assy
			25090-SHW Seal Tool	25090-SHW Seal Tool
			27000-SHW Impeller	27000-SHW Impeller
P2701-01	X	X		X
P2701X	X	X		X
P2702-01	X	X		X
P2703-01	X	X		X
P2704-01	X	X		X
P2705-01	X	X		X
P2706-01	X	X		X
P2708-01	X		X	X
P2708X	X		X	X
P2709-01	X		X	X
P2710-01	X		X	X

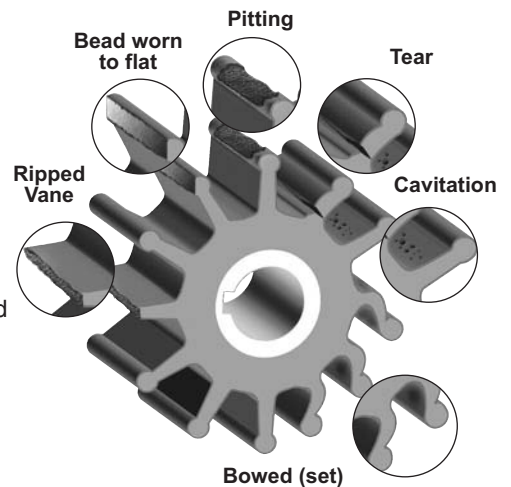
# Inspection

*The #1 reason for premature engine wear is overheating.*

*To maintain engine performance, insist upon genuine Sherwood impellers and service kits.*

## 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, as in the picture below.*
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.



## Genuine Sherwood Tech Tips

**Sherwood 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

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

- Use a non-petroleum based lubricant (silicon 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 when replacing the cover.)

\*See Maintenance Schedule



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