

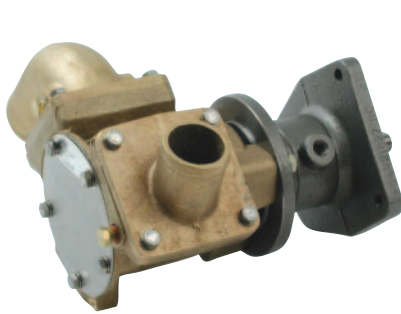


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18000 Pump Series Technical Guide

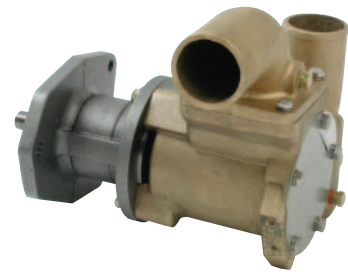
Identification



G1801 and G1805



G1807 and G18071-01



G1804, G1806 and G18061-01



G1811-01



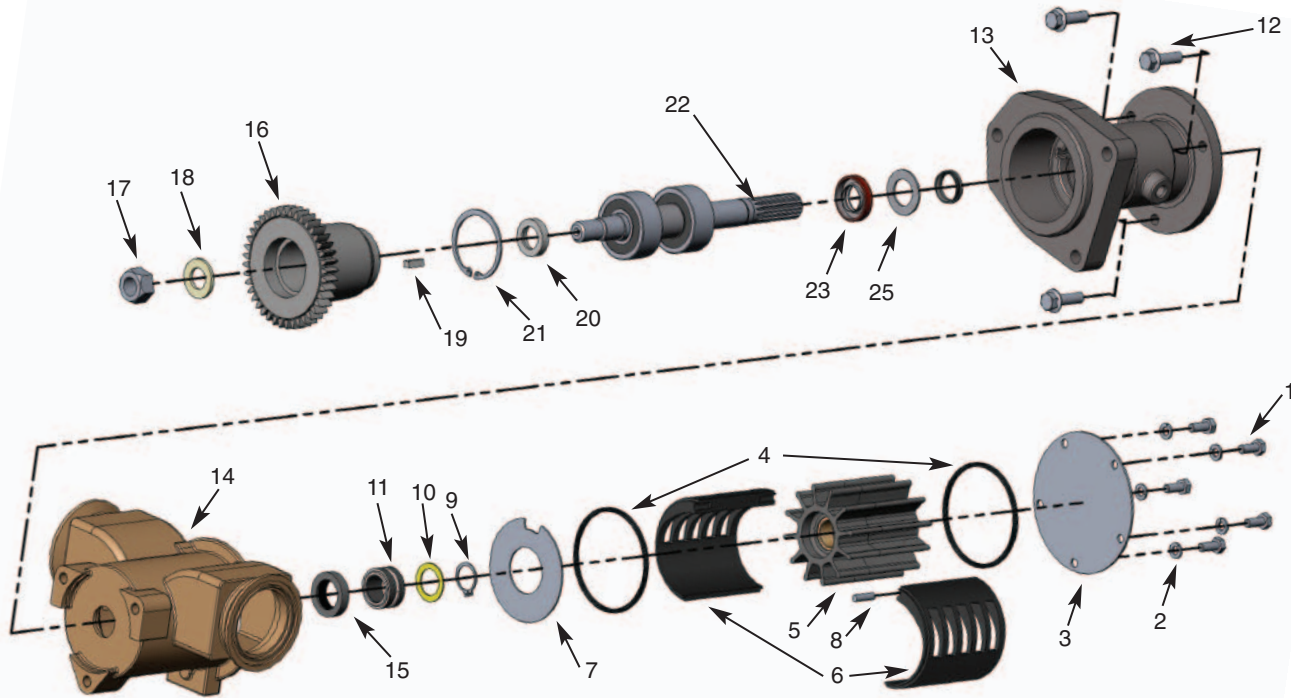
**G1808, G18081-01, G18082-01*
and G18082X***



**G1810, G1810-01, G1810X,
G1814-01 and G1814X**

*G18082-01 and G18082X do not have the oil tap shown in the pump bearing body.

Assembly / Disassembly Instructions



The following assembly/disassembly procedures apply to all 18000 Series pumps. Deviations from pump to pump are primarily a result of different methods of drive and mounting. Pump numbers can be found stamped into the cover plate of the pump.

Disassembly:

- A. Remove the bolts (1) and lockwashers (2) from the cover (3).
- B. Remove the cover, quad rings (4), impeller (5), cam liner halves (6), and wearplate (7). Note the direction of the impeller blades to ensure proper replacement of the impeller during the assembly procedure. **Caution:** The pin (8) might fall out from its place between the cam liner halves.
- C. Using external snap ring pliers, remove the retaining ring (9) from the shaft.
- D. Slide the washer (10) and mechanical seal (11) off of the shaft.
- E. Remove the bolts (12) holding the body (13) to the housing (14).
- F. Slide the housing off of the shaft and body assembly.
- G. Press the seal seat (15) out of the housing.
- H. When applicable remove the drive gear assembly: while supporting the drive gear (16), remove the nut (17), nut washer (18), and key (19) from the shaft. Slide the gear off of the shaft and remove the thrust washer (20) behind the gear.
- I. Using internal snap ring pliers, remove the retaining ring (21) from the body. Remove the bearing shield (24) from the body.
- J. Press the bearing and shaft assembly (22) out of the body.
- K. Remove the lip seal (23) and washer (25) from the body.
- L. Inspect the shaft for grooving of the lip seal area and 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 a wear, replace the entire shaft and bearing assembly (22) listed on page 4.

Warning: Do not try to build the shaft and bearing assembly from the individual parts, but instead purchase the entire shaft and bearing assembly listed below. Due to extremely tight tolerances, special assembly procedures for this assembly must be followed to prevent galling of the shaft in the lip seal area.

Assembly:

- A. Replace the washer (25) then press the lip seal (23) into the pump body (13) with the metal backing ring of the lip seal toward the housing (14) and away from the engine. Care should be taken to insure proper alignment of the lip seal to the pump body and that the lip seal is uniformly pressed to prevent distortion.
- B. Press the shaft and bearing assembly (22) into the pump body.
- C. Slide the bearing shield (24) into the pump body and against the inner bearing.
- D. Using internal snap ring pliers, install the retaining ring (21) into the body.

Assembly / Disassembly Instructions (continued)

- E. Press the mechanical seal seat (15) into the housing with the white ceramic seal face or gray silicon carbide face toward the impeller. Lubricate the outside of the seat boot with a water soluble lubricant or soapy water for easier assembly. Oil or grease must not be used as it will prevent the rubber cup assembly from properly gripping the housing. The seat should be inspected to ensure that the cup did not become partially dislodged during the assembly procedure.
- F. Slide the housing over the shaft and body assembly. Apply Loctite #262 or equivalent to the bolt threads. Fasten the three bolts (12) and torque them to 25 ft-lbs.
- G. When applicable, replace the drive gear assembly. Slide the thrust washer (20) onto the outer bearing. Place the key (19) in the shaft, then slide the gear (16) on the shaft. Apply Loctite #262 or equivalent to the shaft threads. Replace the washer (18), then tighten the nut (17) onto the shaft for the G1808, G18081-01, G18082-01 and G18082X. While supporting the drive gear, torque the nut to 270 ft-lbs. For all other models, refer to applicable engine manufacturer's torque requirements. * 24007 contains 2 thrust washers. The G18082-01 utilizes the 23926 washer, which is .300" thick and 1.38" diameter of solid steel. The G1808 and G18081-01 use the 22779 washer, which is dimensionally the same, except it has a step in the internal diameter.
- H. Lubricate the inter rubber portion of the mechanical seal (11) with a water soluble lubricant or soapy water and slide the seal onto the shaft, with the carbon or silicon carbide portion of the mechanical seal toward the seal seat. Oil or grease must not be used as it will prevent the mechanical seal from properly gripping the shaft.
- I. Place the washer (10) onto the shaft and against the mechanical seal (see below to identify the proper washer) and then using external snap ring pliers, install the retaining ring (9) into the groove in the shaft to compress the mechanical seal.

Seal Washer Selection

When replacing the mechanical seal, it is necessary to ensure the proper seal washer is used to avoid damage to the pump. It is recommended that all pumps be upgraded with the silicon carbide mechanical seal 23837, except for pump number G1810, G1810-01, G1810x, G1811-01, G1815-01, G1816-01, which can only be fitted with the 23512 seal. The G1814-01 and G1814x use the 24511 silicon carbide mechanical seal. Use the following to determine which washer to use:

- When using the silicon carbide mechanical seal 23837 for replacement, determine the proper spacer to use from the chart below. Silicon carbide is characterized by the charcoal gray-colored seal and seat faces, as opposed to carbon on ceramic, which would be black on white.
- Exceptions to the chart:
 - If the pump is to be fitted with the new shaft and bearing assembly listed on the chart on page 3 (24000, 24001, 24002, and 24003), use the 19866 washer. These shaft and bearing assemblies can only be used with the 23837 silicon carbide mechanical seals.
 - Replacement of the seal with the carbon on ceramic mechanical seal 19878 can only be performed on older units with the original shaft and bearing assemblies still in place. Use the 19866 spacer in such cases. Use of the 19878 seal with the current production units (G18061-01, G18071-01, and G18081-01) or with older units fitted with the new shaft and bearing assemblies will cause damage to the pump.

Pump Number	23837 Seal Spacer Number *
G1801	23840
G1804	23840
G1805	23840
G1806	23840
G18061-01	19866
G1807	23840
G18071-01	19866
G1808	23840
G18081-01	19866
G18082-01	19866
All Others**	N/A

Note: If the pump is fitted with a silicon carbide seal, it must be replaced with the 23837 silicon carbide seal to prevent damage.

**Note: The 19866 spacer is .060" thick and the 23840 is .260" thick.*

*** G1810, G1810-01, G1811-01, G1815-01, G1816-01 use the 23512 seal only. The G1814-01 and G1814X use the 24511 silicon carbide mechanical seal.*

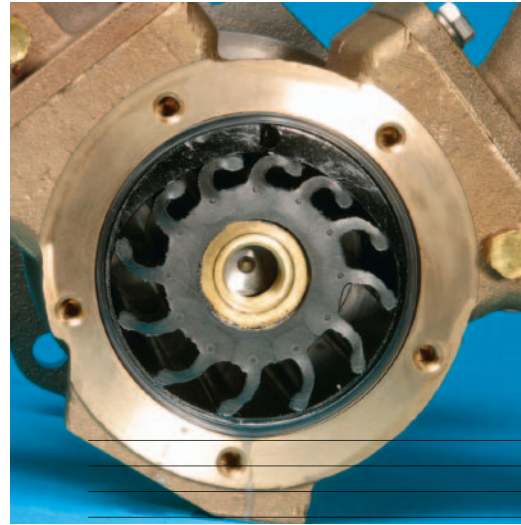
- J. Install the wearplate (7) with the hole in the plate lined up with the slot in the housing. Install the quad ring (4) into the housing and on top of the wearplate.
- K. Create the cam assembly by connecting the cam halves (6) together and installing the pin (8) into the cam liner. A dab of grease can be used to hold the pin in place during installation. Place the cam assembly into the housing, ensuring that the pin aligns with the slot in the housing.
- L. Insert the impeller (5) in the housing using a twisting motion. Ensure that the impeller blades are bent in the same direction as upon removal (dependent on the pump model – see illustration on page 3 for details). For ease of installation apply a silicon lubricant to the impeller. **Caution: DO NOT USE A PETROLEUM-BASED LUBRICANT** (petroleum product will cause damage to the impeller).

Assembly / Disassembly Instructions (continued)



Vanes flipped to the left
(viewed from cover).

Models: G1808, G18081-01, G1810, G1810-01,
G1814-01, G18082, G1814X, G1811-01 and G1816-01



Vanes flipped to the right
(viewed from cover).

Models: G1801, G1804, G1805, G1806,
G18061-01, G1807, G18071-01 and G1815-01

M. Insert the remaining quad ring (4) into the groove, install the cover (3) on the housing, and then fasten the lockwashers (2) and bolts (1) to 8 ft-lbs. torque.

N. After installation, inspect the pump seal, lip seal, body and housing areas for leaks.

Item	Sherwood #	QTY	G1801	G1804	G1805	G1806	G18061-01	G1807	G18071-01	G1808	G18081-01
1	Cap Screw	5	19626	19626	19626	19626	19626	19626	19626	19626	19626
2	Lockwasher	5	15944	15944	15944	15944	15944	15944	15944	15944	15944
3	Cover Plate	1	19837	19837	19837	19837	19837	19837	19837	19837	19837
4	Quad Rings	2	19879	21561	21561	21561	21561	21561	21561	21561	21561
5	Impeller	1	18000	18000	18000	18000	18000	18000	18000	18000	18000
6	Cam Liner Halves	2	19829	21533	21106	21533	21533	21106	21106	21533	21533
7	Wear Plate	1	19836	19836	19836	19836	19836	19836	19836	19836	19836
8	Pin	1		21566	21566	21566	21566	21566	21566	21566	21566
9	Retaining Ring	2	19762	19762	19762	19762	19762	19762	19762	19762	19762
10	Washer	1	19866	19866	19866	19866	19866	19866	19866	19866	19866
11/15	Mechanical Seal Assy	1	19878	19878	19878	19878	23837	19878	23837	19878	23837
12	Bolt	3	21172	21172	21172	21172	21172	21172	21172	21172	21172
13	Body	1	19827	21476	21920	21986	21986	21827	21827	22412	22412
14	Housing	1	19828	21565	21829	21829	21829	21829	21829	22762	22762
16	Gear	1								22789	22789
17	Nut	1								22790	22790
18	Washer	1								22788	22788
19	Key	1								22791	22791
20	Gear Spacer	1								22779	22779
21	Retaining Ring	1	19867	19867	19867	19867	19867	19867	19867	19867	19867
22	Bearing and Shaft Assy	1	24000	24001	24000	24001	24001	25112**	25112**	24002	24002
23	Lip Seal	1	19869	19869	19869	19869	19869	19869	19869	23045	23045
24	Bearing Shield	1									
25	Washer	1	19835	19835	19835	19835	19835	19835	19835	19835	19835
	Minor Repair Kit			24004	24023	24004	24004	24023	24023	24004	24004
	Major Repair Kit			24006	24024	24006	24006	24024	24024	24007	24007

* When using these Shaft and Bearing Assemblies, replace the seal with the silicon carbide mechanical seal 23837 only. Use of the 19878 mechanical seal with these Shaft and Bearing Assemblies may cause pump damage. See "Seal Washer Selection" on page 3.

** 29000 Impeller must be used with the 25112 shaft replacement. The change effectively converts the pump into a G2904x.

Chart (continued)

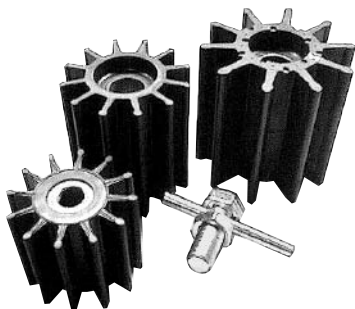
	Sherwood #		G18082-01	G18082X	G1810	G1810-01	G1810X	G1811-01	G1814-01	G1814X	G1815-01	G1816-01
Item		QTY										
1	Cap Screw	5	19626	19626	19626	19626	19626	19626	19626	19626	19626	19626
2	Lockwasher	5	15944	15944	15944	15944	15944	15944	15944	15944	15944	15944
3	Cover Plate	1	19837	19837	19837	19837	19837	19837	19837	19837	19837	19837
4	Quad Rings	2	21561	21561	21561	21561	21561	21561	21561	21561	21561	21561
5	Impeller	1	18000	18000	18000	18000	18000	18000S	18000S	18000	18000S	18000S
6	Cam Liner Halves	2	21533	21533	21106	21106	21106	21106	21106	21106	21533	21533
7	Wear Plate	1	19836	19836	19836	19836	19836	19836	19836	19836	19836	19836
8	Pin	1	21566	21566	21566	21566	21566	21566	21566	21566	21566	21566
9	Retaining Ring	2	19762	19762	19762	19762	19762	19762	19762	19762	19762	19762
10	Washer	1	19866	19866	19866	19866	19866	19866	19866	19866	19866	19866
11/15	Mechanical Seal Assy	1	23837	23837	23512	23512	23512	23512	24511	24511	23512	23512
12	Bolt	3	21172	21172	23296	23296	23296	23296	23296	23296	23296	23296
13	Body	1	23916	23916	23396	23396	23396	24174	23396	23396	24174	24174
14	Housing	1	22762	22762	23523	23523	23523	23523	23523	23523	23523	23523
16	Gear	1	22789	22789								
17	Nut	1	22790	22790								
18	Washer	1	22788	22788								
19	Key	1	22791	22791								
20	Gear Spacer	1	23926	23926								
21	Retaining Ring	1	19867	19867	19867	19867	19867	19867	19867	19867	19867	19867
22	Bearing and Shaft Assy	1	24463	24463	24003	24003	24003	24003	25103***	25103***	24003	24003
23	Lip Seal	1	23045	23045	23045	23045	23045	23045	23045	23045	19869	23045
24	Bearing Shield	1	23425	23425	23425	23425	23425	23425	23425	23425	23425	23425
25	Washer	1										
	Minor Repair Kit		24004	24004	24005	24005	24005	24005			24753	24760
	Major Repair Kit		24007	24007	24008	24008	24008	24008	25045***	25045***	24754	24761

*** 29000 impeller must be used with the 25103 shaft replacement. (The major kit 25045 contains the 29000 impeller and 25103 shaft and bearing assembly as well). The change effectively converts the pump into a G2903x.

Impeller Removal

18000 Impeller & Impeller Puller

The patented 18000 impeller with threaded insert makes replacement easy when using the inexpensive Sherwood Impeller Puller (Model #23631).



Removal

- Remove the cover.
- Insert the Sherwood puller into the threaded insert.
- Screw the puller against the shaft lifting the impeller until loose.
- Twist and pull the impeller out of the pump.

Installation

- Apply a non-petroleum based lubricant to impeller (i.e. silicon or soapy water).
- Install the impeller with a twisting motion onto the shaft.
- Option: Use puller tool to push impeller into pump by loosening and lowering nut until tightening against impeller insert occurs, then turning for installation.
- Then use a small amount of non-petroleum based lubricant to help hold the o-ring in place while replacing the cover.

Use the same puller (#23631) for the 17000 impeller as well.

Preventative Maintenance

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

The #1 reason for premature engine wear is overheating.

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

	Impeller Kit 18000K	Minor Kit 24004	Minor Kit 24023	Minor Kit 24005	Minor Kit 24753	Minor Kit 24760
	1-18000 Impeller 1-19879 O-ring 1-21561 Quad Ring 1-21566 Pin 1-23631 Puller	1-18000 Impeller 2-21561 Quad Ring 1-23837 Seal Assy 1-19762 Snap Ring 1-21566 Pin 1-19866 Washer 1-23840 Spacer 2-21533 Cam Liners	1-18000 Impeller 2-21561 Quad Ring 1-23837 Seal Assy 1-19762 Snap Ring 1-21566 Pin 1-19866 Washer 1-23840 Spacer 2-21106 Cam Liners	1-18000 Impeller 2-21561 Quad Ring 1-24511 Seal Assy 1-19762 Snap Ring 1-21566 Pin 1-19866 Washer 2-21106 Cam Liners	1-18000 Impeller 2-21561 Quad Ring 1-23512 Seal Assy 1-19762 Snap Ring 1-21566 Pin 1-19866 Washer 2-21533 Cam Liners 1-1720-0212 O-Ring 1-1720-0213 O-Ring 1-19836 Wear Plate 1-19837 Cover 1-19869 Lip Seal 1-23631 Puller	1-18000 Impeller 2-21561 Quad Ring 1-23512 Seal Assy 1-19762 Snap Ring 1-21566 Pin 1-19866 Washer 2-21533 Cam Liners 1-1720-0212 O-Ring 1-1720-0213 O-Ring 1-19836 Wear Plate 1-19837 Cover 1-23045 Lip Seal 1-23631 Puller
G1801	X					
G1804	X	X				
G1805	X		X			
G1806	X	X				
G18061-01	X	X				
G1807	X		X			
G18071-01	X		X			
G1808	X	X				
G18081-01	X	X				
G18082-01	X	X				
G1810	X			X		
G1810-01	X			X		
G1810X	X			X		
G1811-01	X			X		
G1814-01	X			X		
G1814X	X			X		
G1815-01	X				X	
G1816-01	X					X

Note: New 23837 silicon carbide mechanical seal – Superior abrasion resistance and longer life. Standard in kits shown above. 23837 is a direct upgrade of the 19878 mechanical seal (see “Seal Washer Selection” on page 3 to determine the proper spacer needed).

Preventative Maintenance (continued)

	Major Kit 24006	Major Kit 24024	Major Kit 24007	Major Kit 24008	Major Kit 25045***	Major Kit 24754	Major Kit 24761
	1-18000 Impeller 2- 21561 Quad Ring 1- 23837 Seal Assy 1- 19762 Snap Ring 1- 19869 Lip Seal 1- 21566 Pin 1- 19867 Snap Ring 1- 19866 Washer 1- 19836 Wear Plate 1- 19837 Cover 1- 23840 Spacer 2- 21533 Cam Liners	1-18000 Impeller 2- 21561 Quad Ring 1- 23837 Seal Assy 1- 19762 Snap Ring 1- 19869 Lip Seal 1- 21566 Pin 1- 19867 Snap Ring 1- 19866 Washer 1- 19836 Wear Plate 1- 19837 Cover 1- 23840 Spacer 2- 21106 Cam Liners	1-18000 Impeller 2- 21561 Quad Ring 1- 23837 Seal Assy 1- 19762 Snap Ring 1- 23045 Lip Seal 1- 21566 Pin 1- 19867 Snap Ring 1- 19866 Washer 1- 19836 Wear Plate 1- 19837 Cover 1- 23840 Spacer 1- 22790 Nut 1- 22788 Washer 1- 22791 Key 1- 22779 Thrust Washer 2- 21533 Cam Liners	1-18000 Impeller 2- 21561 Quad Ring 1- 24511 Seal Assy 1- 19762 Snap Ring 1- 23045 Lip Seal 1- 21566 Pin 1- 19867 Snap Ring 1- 19866 Washer 1- 19836 Wear Plate 1- 19837 Cover 2- 21106 Cam Liners	29000-SHW Impeller 21561-SHW (2) Quad Ring 21566-SHW Pin 19762-SHW Snap Ring 19866-SHW Washer 24511-SHW Seal Assy 1720-0212-SHW O-Ring 1720-0213-SHW O-Ring 19836-SHW Wear Plate 19837-SHW Cover 21106-SHW (2) Cam Half 19867-SHW Snap Ring 19868-SHW Slinger 23045-SHW Lip Seal 23425-SHW Shield 25103-SHW Shaft/Bearing	1-18000 Impeller 2- 21561 Quad Ring 1- 23512 Seal Assy 1- 19762 Snap Ring 1- 21566 Pin 1- 19866 Washer 2- 21533 Cam Liner 1- 1720-0212 O-Ring 2- 1720-0213 O-Ring 1- 19836 Wear Plate 1- 19837 Cover 1- 19869 Lip Seal 1- 23631 Puller 1- 19867 Snap Ring 1- 19868 Slinger 1- 23425 Bearing Shield 1- 24003 Shaft/Bearing	1-18000 Impeller 2- 21561 Quad Ring 1- 23512 Seal Assy 1- 19762 Snap Ring 1- 21566 Pin 1- 19866 Washer 2- 21533 Cam Liner 1- 1720-0212 O-Ring 2- 1720-0213 O-Ring 1- 19836 Wear Plate 1- 19837 Cover 1- 23045 Lip Seal 1- 23631 Puller 1- 19867 Snap Ring 1- 19868 Slinger 1- 23425 Bearing Shield 1- 24003 Shaft/Bearing
G1801							
G1804	X						
G1805		X					
G1806	X						
G18061-01	X						
G1807		X					
G18071-01		X					
G1808			X				
G18081-01			X				
G18082-01			X				
G1810			X				
G1810-01				X			
G1810X				X			
G1811-01				X			
G1814-01					X		
G1814X					X		
G1815-01						X	
G1816-01							X

Note: New 23837 silicon carbide mechanical seal – Superior abrasion resistance and longer life. Standard in kits shown above. 23837 is a direct upgrade of the 19878 mechanical seal (see “Seal Washer Selection” on page 3 to determine the proper spacer needed).

* It is recommended that the shaft and bearing assembly is also replaced during the major rebuild or if the shaft/bearing assembly is damaged. See the chart on page 5 to identify and order the proper assembly.

*** 29000 impeller must be used with the 25103 shaft replacement. (The major kit 25045 contains the 29000 impeller and 25103 shaft and bearing assembly as well).The change effectively converts the pump into a G2903X.

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 major pump rebuild or if wear is evident to maintain pump flow and suction performance.

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

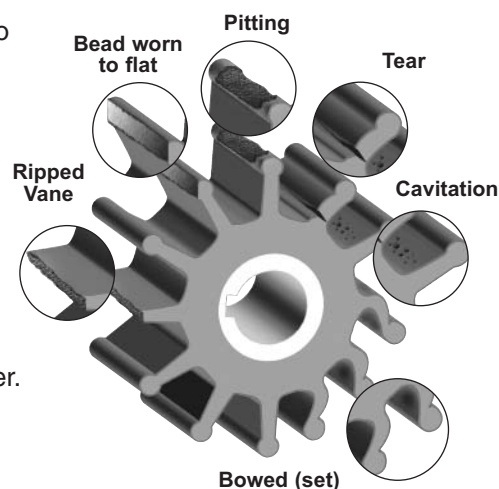
Cover Replace at major pump rebuild or if wear exists to maintain pump flow and suction performance.

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

Lip Seal Replace at 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 as the entire shaft and bearing assembly (see page 4 for proper assembly number).



Genuine Sherwood Tech Tips

To maintain best engine performance and to prolong engine life - replace your impeller annually.*

Three tips to help you install your new 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. The 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.

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 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

* See Maintenance Schedule on page 6



Pentair

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