



The Original Engine Cooling Pump Since 1921

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P Series Technical Guide – 10615 Impeller

Identification

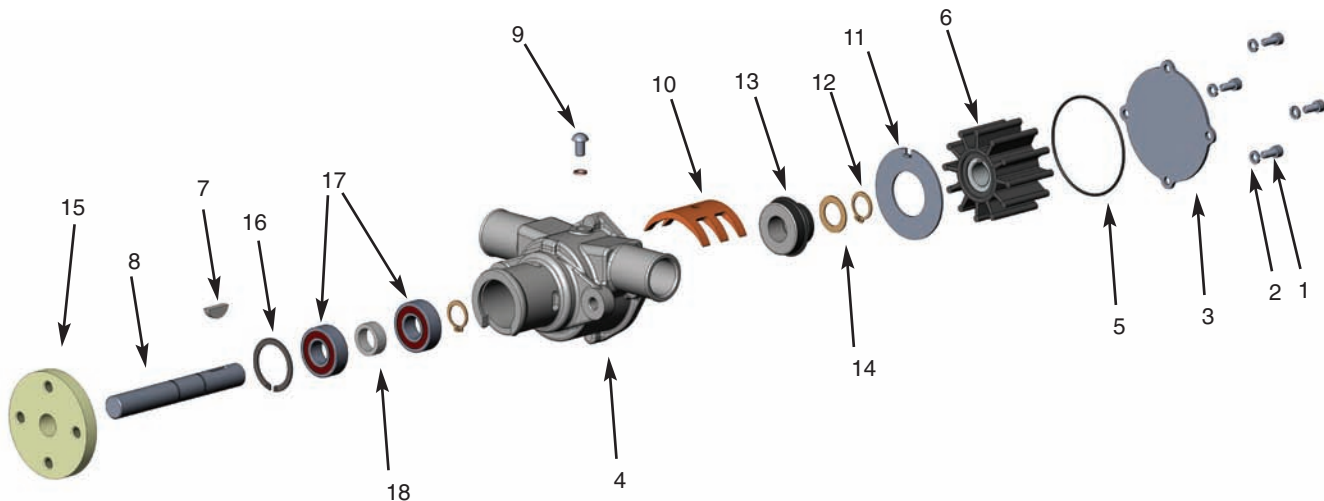


**PCM and Crusader P101,
P1012, P1014, and P1015**



P1016

Assembly / Disassembly Instructions



The following assembly/disassembly procedures apply to many P Series pumps. Deviations from pump to pump are primarily a result of different methods of drive and mounting.

Disassembly:

- A. Remove the screws (1) and lockwashers (2) that hold the cover (3) to the housing (4).
- B. Remove the o-ring or gasket (5) from the housing.
- C. Using two pliers or an impeller puller, remove the impeller (6) from the housing. Knock the key (7) out of the shaft (8).
- D. Remove the cam screw and washer (9) from the cam (10) and pull the cam out of the housing. The wear plate (11) can now be removed from the housing.
- E. Using an external snap ring pliers, remove the retaining ring (12) that holds the seal seat in place. Slide the seal seat (13) and washer (14) off the shaft.
- F. From the drive end of the pump (pulley end or hub end) locate a support directly between the pump housing and hub (15) as close to the shaft as possible. Make sure the housing is free and not supported, and then press the shaft out of the hub.
- G. Remove the large internal retaining ring (16) from the housing at the end of the bearing.
- H. Support the housing and press the shaft, bearings (17), spacer (18), slinger (19), and retaining ring (12) out through the pulley end or hub end of the housing.
- I. The seal assembly (13) is pressed into the body. It can be removed by pushing a tool through the bearing end and up against the metal or back side of the seal.
- J. Remove the retaining ring from the shaft and bearing assembly. Support the bearings on the inner race and push the shaft out of the bearings.

Assembly:

- A. Assemble a retaining ring (12) on the shaft into the second groove from the impeller end. Push the first ball bearing (17) from the pulley or drive end of the pump over the shaft (8) and against the retaining ring by pressing on the inner race of the bearing. Assemble the spacer (18), and then push the second ball bearing on the shaft and against the spacer in the same manner the first bearing was pressed on the shaft. Slide the slinger (19) against the retaining ring (it should be positioned between the bearings and mechanical seal).
- B. Press the mechanical seal (13) into the body from the impeller end. Make sure the seal is pressed in square and that the carbon face is not scratched during assembly. A tool should be used to assure proper assembly. The carbon face is positioned toward the impeller.
- C. Push the bearing and shaft assembly into the housing (4) using care not to cock the bearing. A tool that will give you uniform pressure on the bearing outer race is recommended. Lock the bearing in place with the large internal retaining ring (16).
- D. Assemble the ceramic seat assembly (13), washer (14) and retaining ring (12) over the shaft from the impeller end. Locate the white ceramic surface against the carbon face of the seal. **Warning:** Do not damage (scratch) the white ceramic surface of the seat or the carbon face of the seal – minor scratches can cause the seat assembly to leak. Lubricate the rubber part of the seat with a non-petroleum fluid for ease of assembly.

Assembly / Disassembly Instructions (continued)

- E. Support the shaft at the impeller end without contacting the mechanical seal. Press the hub (15) onto the shaft flush to the ball bearings. Failure to support the shaft or placing pressure against the mechanical seal during this step will cause seal and/or bearing damage.
- F. Place the wear plate (11) in the housing. Put Permatex #1 on the backside of the cam (10) and the screw (9) that retains the cam. Wipe off any Permatex that gets into the impeller cavity. Assemble the cam by placing it into the housing and securing it with the cam screw and washer assembly. Press the woodruff key (9) into the shaft.
- G. Assemble the impeller (5) into the housing. Note: Do not use petroleum-based fluid to lubricate the impeller.
- H. Assemble the gasket or o-ring (5) and cover (3) on the housing. Replace the lockwashers (2) and screws (1) on the cover and torque the screws to 30-42 in-lbs on the P1016 and 50-60 in-lbs for all other pumps.
- I. After installation inspect the pump seal, housing, cam area, and cover for leaks.

Sherwood #		P101	P1012	P1014	P1015	P1016
Engine Manufacturer		Crusader	PCM	PCM	PCM	
Engine Model		220, 270, 300, 350, 454	220, 270, 300, 350, 454	220, 270, 300, 350, 454	220, 270, 300, 350, 454	
Item	QTY	40050	RP061017		RP061017	
1	Cap Screw	4	21381	23966	23966	24888
2	Lockwasher	4	00343	00343	00343	24889
3	Cover Plate	1	19291	23946	21120	24887
4	Housing	1	19294	19294	24107	24882
5	O-Ring/Gasket	1	19251	19251	12231	12231
6	Impeller	1	10615	10615	10615	10615
7	Key	1	04432	04432	04432	04432
8	Shaft	1	19293	19293	19293	24885
9	Cam Screw Assy.	1	10515C	10515C	10515C	24884/19996
10	Cam	1	10944	10944	10944	10929
11	Wear Plate	1	19295	19295	19295	19295
12	Retaining Ring	2	04258	04258	04258	04258
13	Water Seal/Seat Assy.	1	12859	12859	12859	12859
14	Washer	1	04264	04264	04264	04264
15	Hub	1	97176	97176	97176	24883
16	Retaining Ring	1	04259	04259	04259	04259
17	Bearing	2	12211	12211	12211	12211
18	Spacer	1	05133	05133	05133	24886
	Minor Repair Kit		19301	23976	23976	23976
	Major Repair Kit		25029	25029	25030	25028

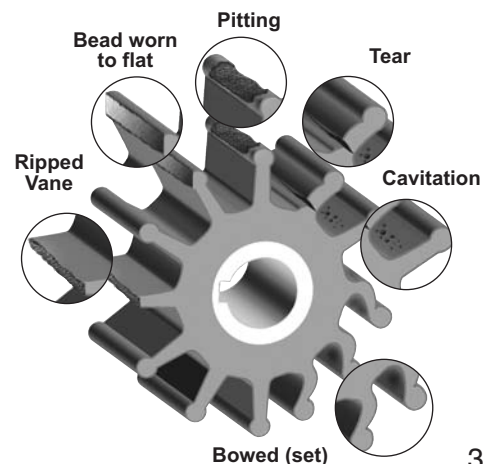
Inspection

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 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/bearing assembly replacement.
- Bearing Inspect for loss of grease, corrosion or rough rotation. Replace the entire shaft and bearing assembly if these conditions exist or if the bearing integrity is in doubt.



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 10615K	Minor Kit 19301	Minor Kit 23976	Major Kit 25028	Major Kit 25029	Major Kit 25030
	1-10615 Impeller	1-10615 Impeller	1-04258 Snap Ring	2-04258 Snap Ring	2-04258 Snap Ring	2-04258 Snap Ring
	1-12231 O-Ring	1-19251 Gasket	1-04259 Snap Ring	1-04259 Snap Ring	1-04259 Snap Ring	1-04259 Snap Ring
	1-19251 Gasket	1-12859 Seal Assy.	1-04264 Washer	1-04264 Washer	1-04264 Washer	1-04264 Washer
			1-04432 Key	1-04432 Key	1-04432 Key	1-04432 Key
			1-10615 Impeller	1-10615 Impeller	1-10615 Impeller	1-10615 Impeller
			1-12231 O-Ring	1-12231 O-Ring	1-19251 Gasket	1-12231 O-Ring
			1-12859 Seal Assy.	1-12859 Seal Assy.	1-12859 Seal Assy.	1-12859 Seal Assy.
			1-12855 NOT USED	1-10929 Cam	1-10944 Cam	1-10944 Cam
				2-12211 Bearing	2-12211 Bearing	2-12211 Bearing
				1-19295 Wear Plate	1-19295 Wear Plate	1-19295 Wear Plate
				1-19996 Cam Screw Washer	1-10515C Cam Screw Assy.	1-10515C Cam Screw Assy.
				1-24884 Cam Screw	1-23946 Cover	1-21120 Cover
				1-24887 Cover		
P101	X	X			X	
P1012	X	X			X	
P1014	X		X			X
P1015	X		X			X
P1016	X		X	X		

