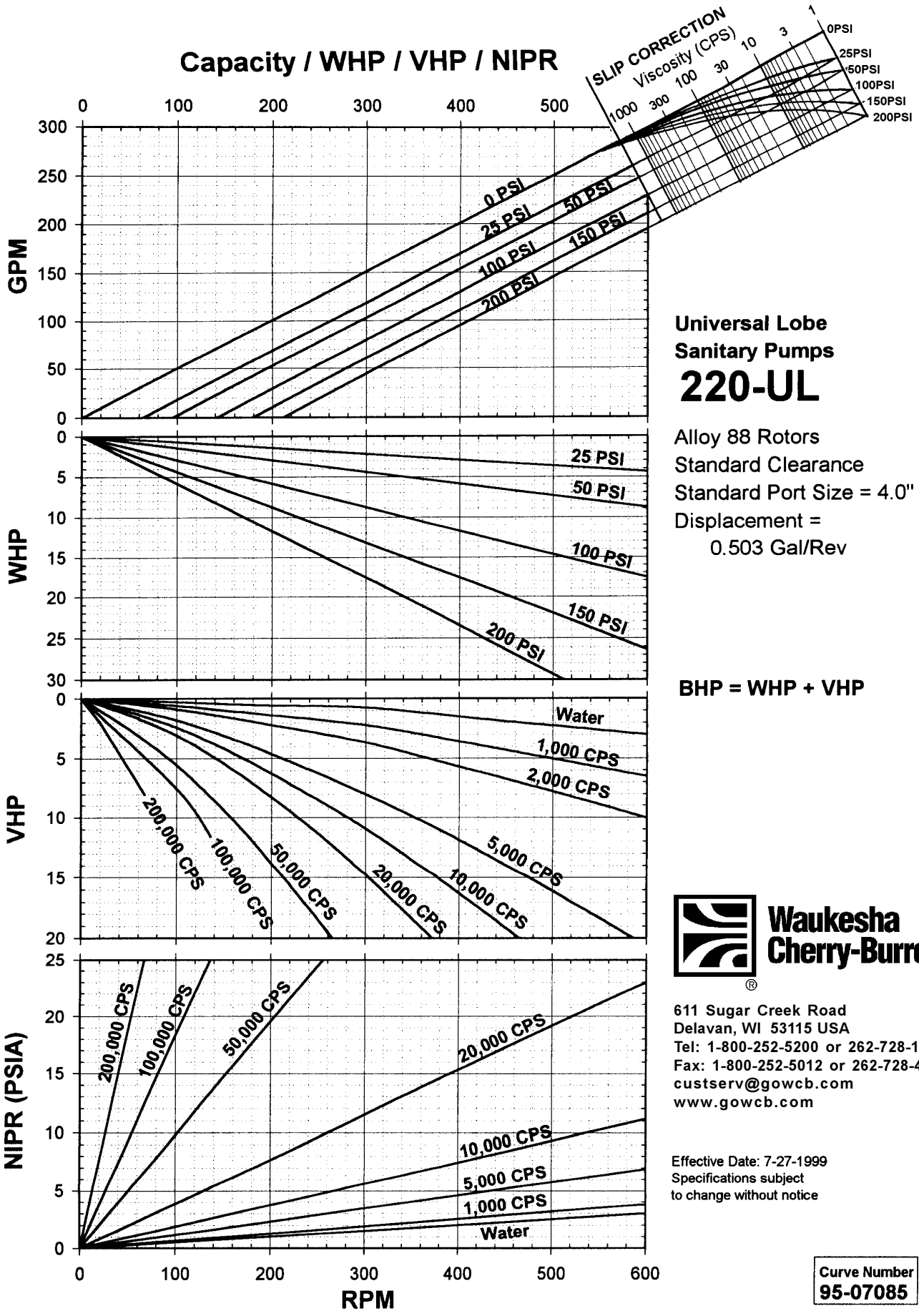


Universal Lobe
Sanitary Pumps

220-UL

Alloy 88 Rotors
Standard Clearance
Standard Port Size = 4.0"
Displacement =
0.503 Gal/Rev

BHP = WHP + VHP

Waukesha Cherry-Burrell

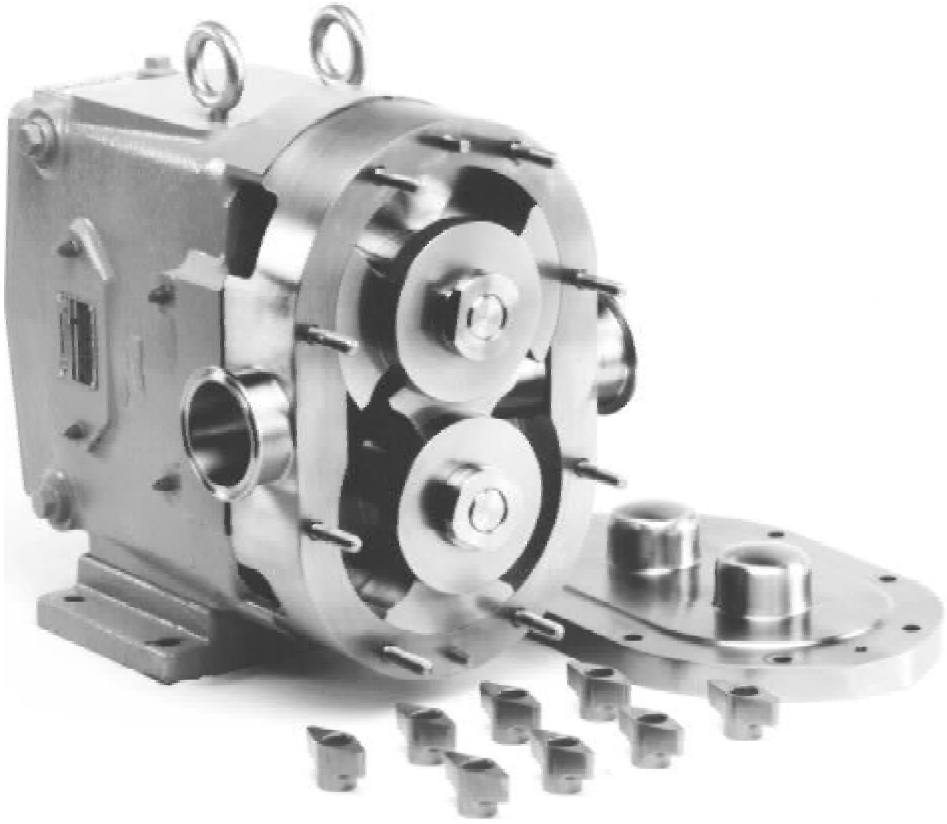
611 Sugar Creek Road
Delavan, WI 53115 USA
Tel: 1-800-252-5200 or 262-728-1900
Fax: 1-800-252-5012 or 262-728-4904
custserv@gowcb.com
www.gowcb.com

Effective Date: 7-27-1999
Specifications subject
to change without notice

Curve Number
95-07085

Waukesha Cherry-Burrell
A United Dominion Company

Read and understand this manual prior to installing, operating or maintaining this pump.



Waukesha Pumps

UNIVERSAL SERIES

OPERATION MAINTENANCE & PARTS LIST

TROUBLESHOOTING

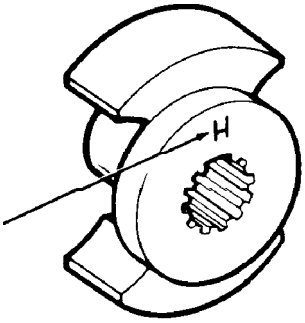
Problem	Probable Causes	Solutions
Noisy operation	**• Rotor to body contact** Distortion of pump due to improper piping installation.	Reassemble pump or re-install piping to assure free running
	Pressure higher than rated	Reduce pressure if possible
	Worn bearing	Rebuild with new bearings. Lubricate regularly
	Worn gears	Rebuild with new gears. Lubricate regularly
	Rotor to rotor contact	
	Loose or mis-timed gears. twisted shaft, sheared keys. worn splines	Rebuild with new parts
	• Relief valve chattering	Re-adjust, repair or replace
	• Drive component noise-gear trains, chains, couplings, bearings.	Repair or replace drive train
Pump requires excessive power (overheats, stalls. high current draw, breakers trip)	**• Higher viscous losses than expected**	If within pump rating, increase drive size
	• Higher pressure than expected	Reduce pump speed, increase line sizes
	• Fluid characteristics	
	Fluid colder than expected. viscosity high	Heat fluid. insulate or heat trace lines. Use pump with more running clearances.
	Fluid sets up in line and pump during shut down	Insulate or heat trace line. Install "soft start" drive. Install recirculating bypass system. Flush with other fluid.
	Fluid builds up on pump surfaces (example. latex, chocolate. fondants)	Use pump with more running clearance
"Short" pump service life	High corrosion rate	Upgrade material of pump
	Pumping abrasives	Larger pumps at slower speeds, can help
	Speeds and pressures higher than rated	Reduce speeds and pressures by changes in system
	Worn bearings and gears due to lack of lubrication	Set up and follow regular lubrication schedule
	Misalignment of drive and piping. Excessive overhung load or misaligned couplings.	Check alignment of piping. Check drive alignment and loads. (Page 9)

SECTION V
OPERATION

NORMAL OPERATION

Normal operation covers a speed range of 0-600 RPM and pressure range of 0-200 PSI. Temperature range with standard rotors is -40° to 200° F and with hot clearance rotors, 180° to 300° F. (For operation at higher temperatures, consult factory.)

WARNING
STOP PUMP AND LOCK OUT ALL POWER PRIOR TO SERVICING



NOTE: *All hot clearance rotors are identified with a etched letter "H" on rotor hub.*

LUBRICATION

The gears are factory lubricated with Micro-Plate No. 140 oil at the quantity shown for top or bottom shaft mounts. *(14, 34, 64, 134, 224 and 324 are filled for side mount.)* If you mount your pump other than top or bottom shaft drive, check oil level.

The bearings are factory greased with Micro-Plate #555 grease.

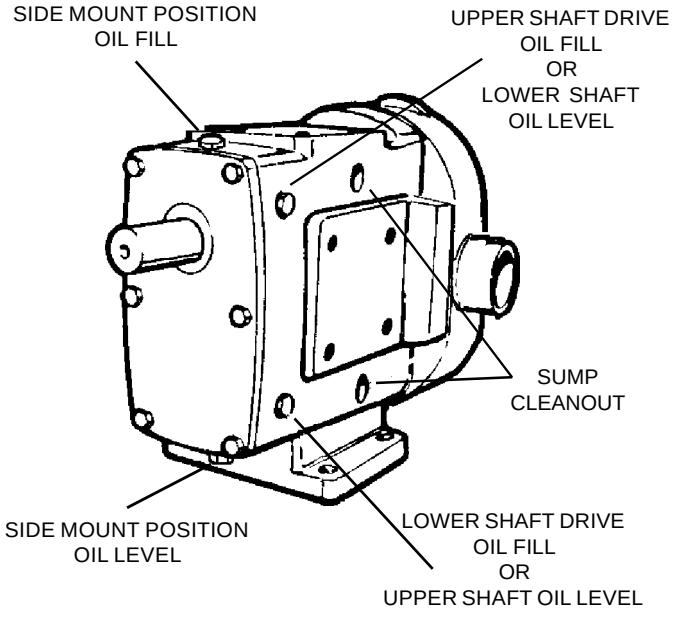
Change oil every 500 hours . If pump is installed where moisture and condensation are heavy, change oil more frequently.

Bearings must be greased every 250 hours or less depending on moisture and condensation conditions. Excess grease will accumulate in the gear case and can be removed through the cleanout hole covered with plastic plug.

NOTE: For hot or cold extremes use appropriate lubricant as shown in the following table.

OIL
Micro-Plate #140 (-10° to 350° F)

GREASE
Silicone (-20° to +5° F)
Micro-Plate #555 (+5° to +350° F)



(UPPER SHAFT DRIVE POSITION SHOWN)

OIL CAPACITY (GEARS)		
MODEL	**TOP OR BOTTOM SHAFT**	**SIDE MOUNT**
6,12,14, 15, 18,22	1.3 oz. (40 ml)	3.3 oz. (100 ml)
30 ,32 33A, 34	2 oz.(60 ml)	4 oz. (120 ml)
60,62, 64	6 oz.(170 ml)	9.5 oz.(280 ml)
130 132,133A,134	6 oz.(170 ml)	9.5 oz.(280 ml)
220 ,222 ,223 224	11 oz. (320 ml)	20 oz. (600 ml)
320, 324, 323A	17 oz.(500 ml)	44 oz. (1300 ml)

DRIVE LUBRICATION

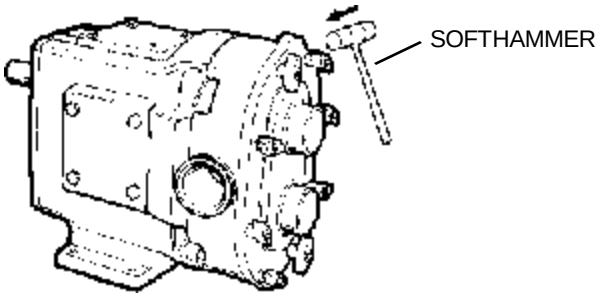
Refer to drive manufacturer's manual shipped with unit.

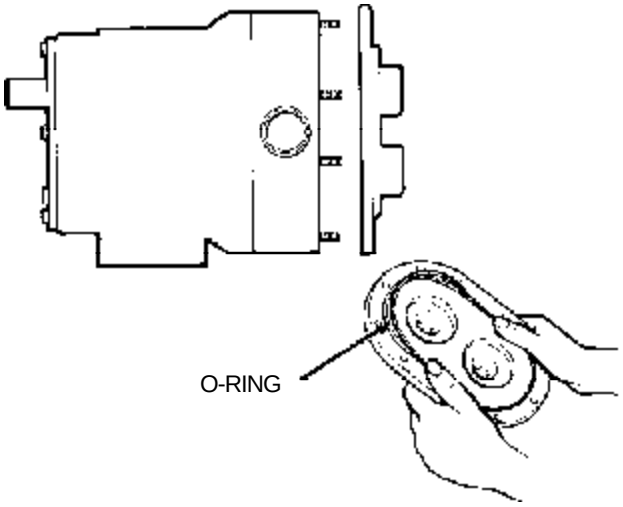
CLEANING

The Waukesha pump is designed to be completely disassembled for thorough and easy cleaning .Clean the pump every day or at the end of a process. Disassemble the fluid head as outlined. Remove and clean the O-rings, sleeves and pump seals. Cleaning the pump "in-place" is not recommended, except for the self-cleaning CIP pump series (Model 12, 22, 32, 62, 132 and 222)

FLUID HEAD DISASSEMBLY - ALL MODELS

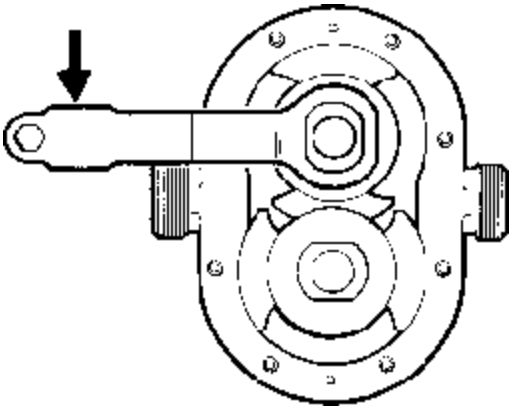
1. Shut off power and isolation valves and disconnect inlet and discharge lines.
2. Remove wing nuts using soft hammer to loosen them.

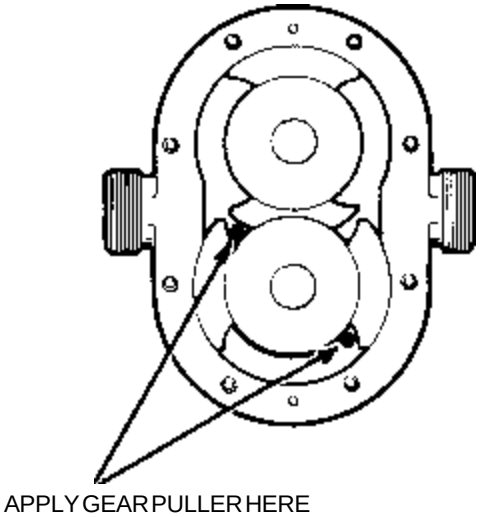




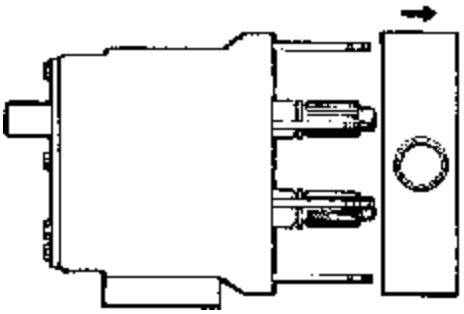
3. Remove cover. If it is stuck, loosen it with a soft hammer. Remove and discard cover "O" ring.

4. Remove rotor retaining nuts. Use the special wrench supplied with pump and hit it sharply with a soft hammer to loosen nuts.





5. Orient rotors perpendicular to each other and remove rotor with both wings exposed first. Handle rotors with care to avoid knicks and scratches. If it is stuck tight, use a gear puller or hardwood lever behind rotor hub to force it off spline.



6. Remove pump body by pulling it straight off studs. Use a soft hammer to assist if body is stuck tight.

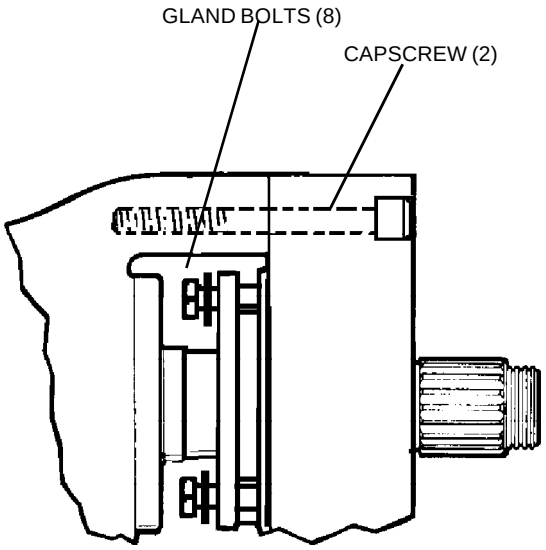
7. See Section VI for seal disassembly procedure.

8. Clean and inspect body thoroughly.

CAUTION: Body must be reassembled on bearing housing from which it was removed. Both are identified with same serial number.

MODEL 320 and 324 BODY DISASSEMBLY

1. After removing the cover and rotors, remove the four bolts from each seal gland and slide the gland toward the gear case. Loosen the two socket head cap screws from the front of the body. Tap the body with a soft hammer to drive body loose from gear case and dowel pins.

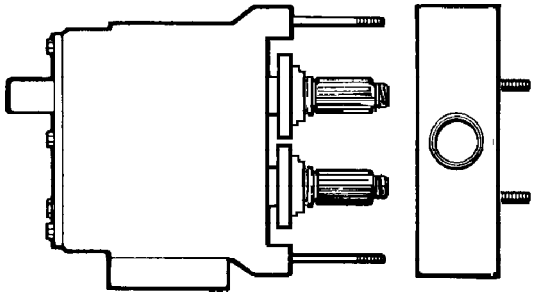


MODEL 323 ASEPTIC BODY DISASSEMBLY

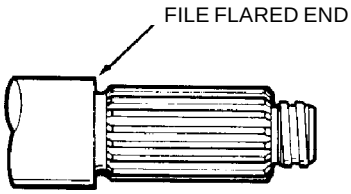
1. Disconnect flushing lines.

2. Remove cap screws from seal flush glands and slide glands back against gear case.

3. Loosen two socket head cap screws in front of body. Tap body with a soft hammer to drive body loose from gear case and dowel pins.



4. Thoroughly clean the shafts. Remove "flared end" to aid in seal removal.



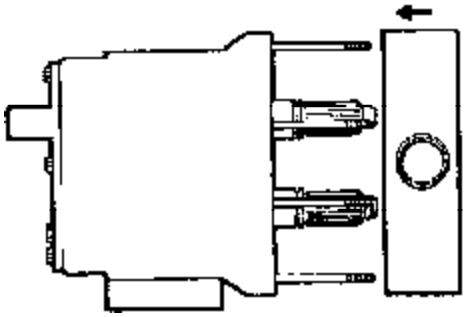
CLEANING PROCEDURE

Use a basket or wash tank having the bottom covered with a rubber mat. Wash parts thoroughly with cleaning compound using brushes and plenty of fresh warm water at about 125° F. Rinse the parts thoroughly with 170° F. water and store them to permit free draining and natural drying. Reassemble pump and sterilize it in accordance with accepted sterilizing practices. If chlorine solution (200 ppm available chlorine) is used, it should leave no residual deposits which would remain in the pump.

NOTE: Acid cleaners have a much higher metal corrosion rate and, therefore, pump parts should remain in acid cleaning solutions no longer than necessary. Any strong inorganic mineral base acids harmful to your hands would be harmful to pump parts. Due to the high circulation required, Waukesha Fluid Handling recommends that its pumps not be used to recirculate cleaning solutions.

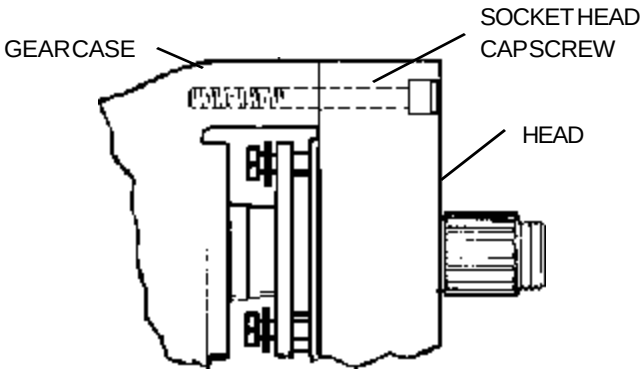
FLUID HEAD ASSEMBLY - MOST MODELS

Seal Assembly See SEAL MAINTENANCE, page 22 for assembly procedure on all models.



Body Assembly

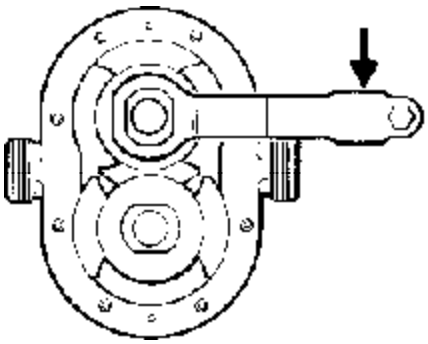
1. Slide body over shafts and studs being careful seal components are not knicked or knocked out of place. Press body firmly against gear case engaging dowels.



2. **Model 320, 324 and 323A** bodies are secured to the gearcase with 2 socket head cap screwsd thru the head. (For seals see page 26 thru 28.)

Rotor Assembly

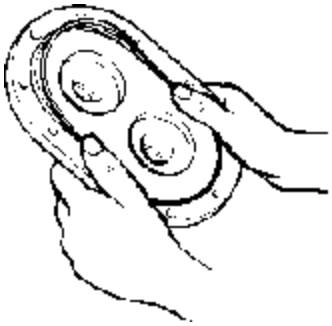
Assemble a rotor onto shaft engaging the large spline tooth with the large groove in rotor. Rotate shaft until rotor wings are on vertical centerline. Install the second rotor and secure both with rotor retaining nuts (clockwise). Lock the nuts. *(See torque table on page 43)* **NOTE: CIP pumps have right hand and left hand nuts.** (12, 22, 32, 62, 132 and 222)

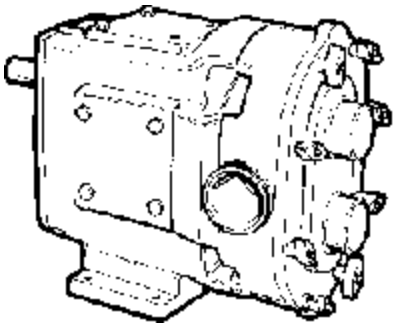


Cover Assembly

1. Install O-ring in cover groove.

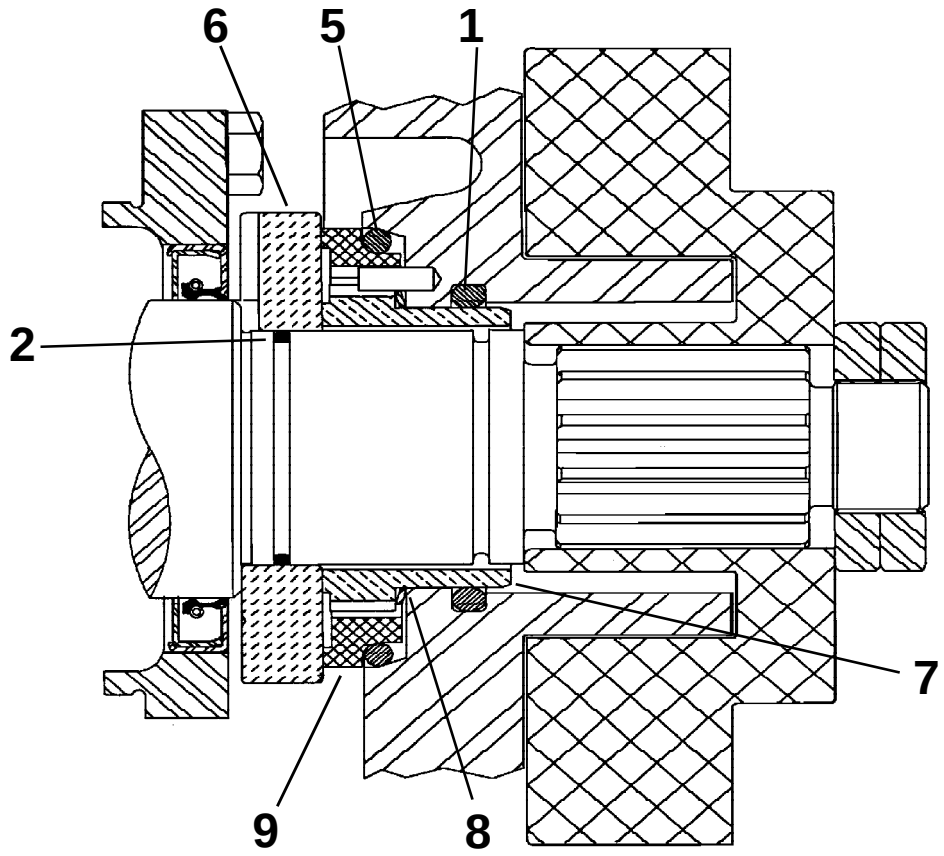
2. Mount cover on studs and push it against body being sure O-ring remains in the groove.





3. Attach wing nuts (clockwise) and tighten by hitting them sharply with a soft hammer.

WAUKESHA UNIVERSAL PUMP



DOUBLE MECHANICAL SEAL/FLUSHING

Model 60 - 64 - 130 - 134

Item	Description	Qty.	Part No.
1	O-Ring, Body	2	N70331
2	O-Ring, Shaft	2	N70131
5	O-Ring	2	N50338
6	Seal Sea, Ceramic	2	060 014 002
	Seal Seat, Chrome Oxide	2	060 014 001
	Seal Seat, Silicon Carbide	2	060 014 009
7	Seal Inner, Carbon	2	060 306 001
	Seal Inner, Ceramic	2	40642
	Seal Inner, Chrome Oxide	2	060 306 002
	Seal Inner, Carbon (One Piece)	2	060 306 007
	Seal Inner, Silicon Carbide	2	060 306 009
8	Wave Spring	2	060 304 000
9	Outer Seal, Chrome Oxide	2	060 206 002
	Outer Seal, Carbon (One Piece)	2	060 206 007

60 - NOTE: Use 060 001 011 Pump Body for Flush
130 -NOTE: Use 130 001 011 Pump Body for Flush

Model 220 - 224

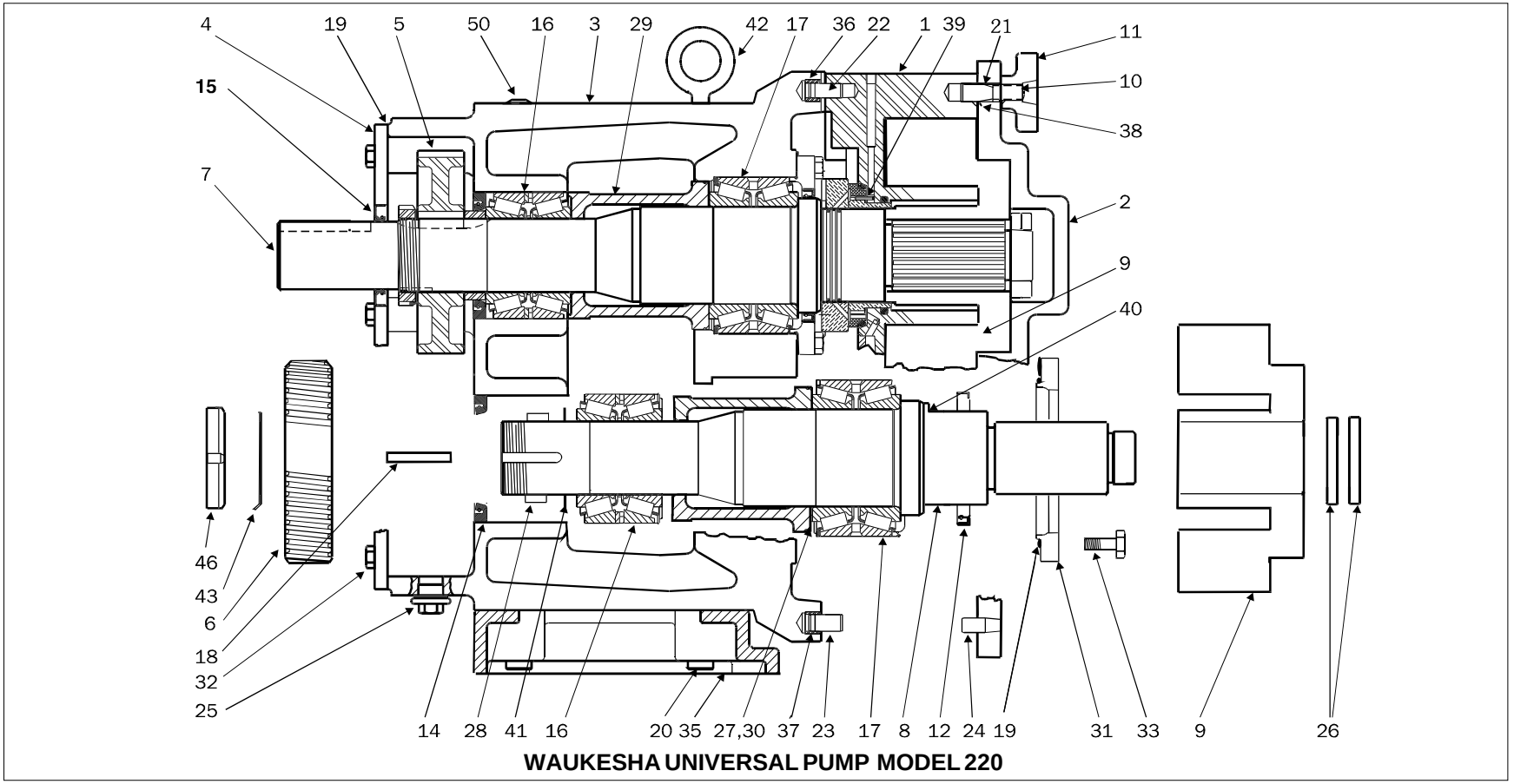
Item	Description	Qty.	Part No.
1	O-Ring, Body	2	N70338
2	O-Ring, Shaft	2	N70144
5	O-Ring	2	N50344
6	Seal Seat, Ceramic	2	220 014 002
	Seal Seat, Chrome Oxide	2	220 014 001
	Seal Seat, Silicon Carbide	2	220 014 009
7	Seal Inner, Carbon	2	220 306 001
	Seal Inner, Ceramic	2	40830
	Seal Inner, Chrome Oxide	2	220 306 002
	Seal Inner, Carbon (One Piece)	2	220 306 007
	Seal Inner, Silicon Carbide	2	220 306 009
8	Wave Spring	2	220 304 000
9	Outer Seal, Chrome Oxide	2	220 206 002
	Outer Seal, Carbon (One Piece)	2	220 206 007

NOTE: Use 220 001 011 Pump Body for Flush

(Quantities are per pump)

***CAUTION**: This seal requires flushing to be connected and flowing before operating pump.*

WAUKESHA UNIVERSAL PUMP MODEL 220



WAUKESHA UNIVERSAL PUMP MODEL 220

Item	Description	Qty.	Part No.
*1	Pump Body	1	220 001 010
	Pump Body - Flushing	1	220 001 011
*2	Pump Cover	1	GD0 002 S00
*3	Gear Case	1	230 105 000
*4	Gear Case Cover	1	230 106 000
5	Gear, Drive Shaft	1	200 007 001
6	Gear, Short Shaft	1	200 007 002
7	Drive Shaft	1	220 008 001
8	Short Shaft	1	220 009 001
*9	Rotor, Twin Blade	2	220 010 000
10	Stud	**8	GGA 011 000
11	Wing Nut	8	GD0 016 002
12	Grease Seal, Front Brg. Retainer	2	STD 030 002
13	Grease Seal, Front Brg. Rear	2	STD 030 005
14	Oil Seal, Gear Case, Rear	2	STD 119 002
15	Oil Seal, Gear Case Cover	1	STD 030 006
16	Bearing, Rear	2	200 035 000
17	Bearing, Front	2	200 036 000
18	Key, Gear	2	200 037 000
19	Silicone Sealant	3	000 142 301
20	Socket Head Capscrew	4	30-311

Item	Description	Qty.	Part No.
21	Dowel Pin - Cover, Upper	1	GD0 040 000
22	Dowel Pin -Gear Case, Upper	1	GD0 040 R00
23	Dowel Pin - Gear Case, Lower	1	CD0 040 R10
24	Dowel Pin - Cover, Lower	1	GD0 040 100
25	Hex Capscrew,Fill, Drain, Level	6	000 046 004
26	Rotor Jam Nut	4	GD0 052 001
27	Shim, Front Bearing	AR	220 054 XXX
28	Spacer, Gear	2	200 055 000
29	Spacer, Bearing	2	40752
30	Front Bearing Shim	4	220 054 050
31	Bearing Retainer	2	220 080 000
32	Hex Capscrew Gear Case Cover	6	30-341
33	Hex Capscrew, Bearing Retainer	8	30-351
†	Grease Fitting	4	BD0 092 000
35	Gear Case Base	1	230 110 000
36	Dowel Bushing, Upper	1	CD0 116 000
37	Dowel Bushing, Lower	1	CD0 116 100
38	O-Ring Cover, Buna N	1	GD0 117 000
39	Stop Pin, Seal	2	223 126 000
40	Drive Pin	2	CD0 126 000
41	Spacer Seal	2	200 127 000

Item	Description	Qty.	Part No.
42	Eye Bolt	2	30-360
43	Lockwasher, Gear	2	STD 136 011
46	Locknut, Gear Rear	2	STD 236 011
†*	Stud Retainer Assembly	1	230 064 000
	OIL, MICROPLATE #140		
	1 Gallon Can		000 140 000
	1 Quart Can		000 141 000
	GREASE, MICROPLATE #555		
	1 Pound Tube		000 142 000
†	O-Ring Removal Tool	1	AD0 096 001
†	Rotor Nut Wrench	1	GD0 019 000
50	Plastic Cap	4	BD0 093 000

AR= As Required
† Not Shown
* See Vented Cover Section Page 44 for Assembly Options and Parts Breakdown
* Pump S/N Required
** 6 Required for pumps prior to 1988
†*Required for pumps prior to 1988

NOTE: *See Pages , 60-65 for Seal Option Identification.*