

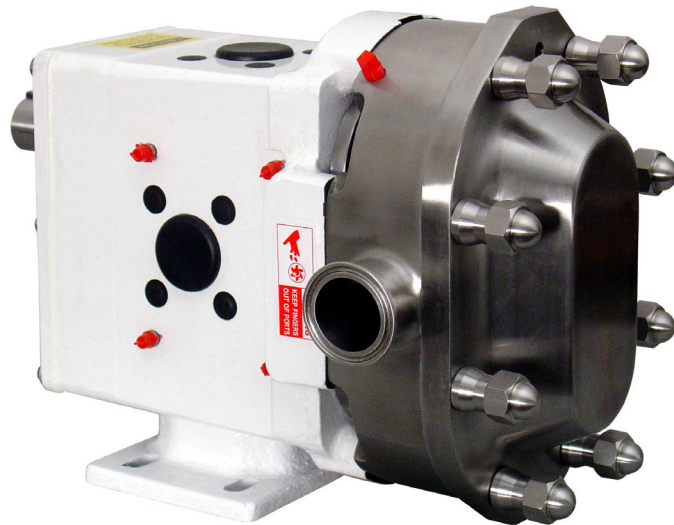
WRIGHT PUMP

IDEX
IDEX CORPORATION



INSTALLATION AND MAINTENANCE MANUAL FOR TRA20 SERIES PUMP MODELS

0060 0180 0450 1300 2200
0150 0300 0600 1800 3200



PARTS LISTS AND INSTRUCTIONS FOR NON-STANDARD
FEATURES ARE FURNISHED AS ADDENDA TO THIS MANUAL

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TOOLS REQUIRED FOR DISASSEMBLY/ASSEMBLY

“O” ring removal tool—supplied with pump

Soft-faced hammer

Suitable gear puller

Allen wrenches

Hydraulic press

Suitable V blocks

Torque wrench—see page 15

Measuring tools—see page 18

Spanner wrenches for gear end lock nuts—available from Wright Pump



WT0150SPWRENCH
WT0300SPWRENCH
WT0600SPWRENCH
WT2200SPWRENCH

INTRODUCTION

Thank you for purchasing this Wright Pump model. To ensure the best possible service read and understand this manual prior to installation, operation or maintaining this pump. For questions regarding installation, operation or maintenance contact your distributor or Wright Pump.

SAFETY

INCORRECT INSTALLATION, OPERATION OR MAINTENANCE OF EQUIPMENT MAY CAUSE SEVERE PERSONAL INJURY OR DEATH AND/OR EQUIPMENT DAMAGE AND MAY INVALIDATE THE WARRANTY. THIS INFORMATION MUST BE READ FULLY BEFORE BEGINNING INSTALLATION, OPERATION OR MAINTENANCE AND MUST BE KEPT WITH THE PUMP. ALL INSTALLATION AND MAINTENANCE MUST BE UNDERTAKEN BY SUITABLY TRAINED OR QUALIFIED PERSONS ONLY.

Safety instructions are identified in this manual with the symbol , and where electrical safety is involved with the symbol . The symbol **ATTENTION** is used to call attention to instructions important to protection of equipment.

WARNING: Hazards or unsafe practices that could result in severe personal injury or death, and how to avoid them.

CAUTION: Hazards or unsafe practices that could result in minor personal injury or damage to product or property.

WARNING
TO AVOID SERIOUS INJURY OR DEATH
DO NOT INSTALL OR SERVICE PUMP
UNLESS POWER IS OFF AND LOCKED
OUT

WARNING
ELECTRICAL CONNECTIONS MUST BE
MADE BY A REGISTERED ELECTRICIAN
IN ACCORDANCE WITH LOCAL CODES
AND STANDARDS

WARNING
BEFORE SERVICING PUMP REFER
TO MATERIAL SAFETY DATA SHEET
(MSDS) FOR SAFE HANDLING OF THE
MATERIAL BEING PUMPED

WARNING
DO NOT OPERATE PUMP UNLESS
OVER-PRESSURE PROTECTION IS
INSTALLED IN DISCHARGE
PIPING

WARNING
DO NOT OPERATE PUMP
WITHOUT GUARDS IN PLACE

WARNING
DO NOT PUT FINGERS IN PORTS OR
NEAR ROTATING MEMBERS

WARNING
STAY CLEAR OF MOTOR SHAFT
AND COUPLING WHEN JOGGING
MOTOR

WARNING
RELIEVE SYSTEM PRESSURE BEFORE
REMOVING COVER OR PORT
CONNECTIONS

WARNING
DO NOT OPERATE PUMP UNDER
POWER WITH COVER REMOVED

CAUTION
HANDLE ALL PARTS WITH CARE
TO AVOID NICKS AND SCRATCHES
WHICH MAY AFFECT
PUMP OPERATION

CAUTION
OPERATION OF THE PUMP WITH
INLET AND/OR OUTLET VALVES
IN THE CLOSED POSITION CAN CAUSE
DAMAGE TO THE PUMP

CAUTION
PUMP COMPONENTS HAVE VERY CLOSE CLEARANCES. DO NOT PERMIT FOREIGN OBJECTS TO ENTER THE PUMP

CAUTION
BEFORE OPERATING PUMP UNDER POWER MAKE SURE SYSTEM IS CLEAN AND FREE OF FOREIGN OBJECTS. DO NOT USE PUMP TO REMOVE FOREIGN OBJECTS

WRIGHT PUMP WARRANTY

Wright Pump warrants all products manufactured by it to be free from defects in workmanship or material for a period of one (1) year from date of startup, provided that in no event shall this warranty extend more than eighteen (18) months from date of shipment from Wright Pump. If during said warranty period, any products sold by Wright Pump prove to be defective in workmanship or material under normal use and service, and if such products are returned to the Wright Pump factory at Waukesha Wisconsin they will be replaced or repaired free of charge. F. O. B. Waukesha, Wisconsin.

Wright Pump assumes no liability for consequential damages of any kind and the purchaser, by acceptance of delivery, assumes all liability for the consequences of use or misuse by the purchaser, his employees or others. Wright Pump will assume no field expense for service or parts unless approved by Wright Pump in advance.

Equipment and accessories purchases by Wright Pump from outside sources that are incorporated into any Wright Pump product are warranted only to the extent of, and by the original manufacturer's warranty or guarantee, if any.

THIS IS WRIGHT PUMP'S SOLE WARRANTY AND IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, WHICH ARE HEREBY EXCLUDED, INCLUDING IN PARTICULAR ARE WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

No officer or employee of IDEX Corporation or Wright Pump is authorized to alter this warranty.

GENERAL INFORMATION

Each Wright Pump product is shipped completely assembled and ready for use. Normal maintenance as outlined in this manual will provide long, trouble free service when the pumps is incorporated in a properly designed system.

Inspection at receipt: ports are covered at the factory to prevent dirt and foreign objects from entering the pump head. If port covers are damaged or missing remove the pump cover to ensure the pump is clean and free of foreign objects or materials before rotating the shaft. If the pump is damaged in transit file a claim with the carrier right away. The carrier has a Bill of Lading showing that the shipment was received from us in good condition.

Returns: when necessary to return product under warranty or for any other reason, first contact Wright Pump to receive a Return Goods Authorization number to facilitate getting the product back to you as soon as possible.

NORMAL OPERATION

Normal operation of Wright Pump products is within a range of 0 to 600 rpm, and a pressure range of 0 to 450 psi. Standard rotors operate within a temperature range of -40°F to 200°F . Hot clearance rotors operate at 200°F to 300°F . Consult factory for operation at other values.

INSTALLATION

Installation should follow good practice to provide the best performance and installation must meet local code requirements. All system components must be correctly sized to provide satisfactory operation of your Wright Pump product.

Consideration must be given to the following in order to achieve proper installation

1. Pumps of this type are usually mounted on a base plate common with the drive unit. Bases may be permanently mounted, be self leveling and with vibration isolation pads, have adjustable legs or be portable. Bases should be level during pump operation.
2. Provide power as required by the motor and controls as needed for system operation.



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AND STANDARDS



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3. Piping should be supported independently of the pump to prevent misalignment of pump parts that will cause excessive wear to rotors, bearings and shafts. Use of thermal expansion (flexible) joints will also minimize forces exerted on the pump. Inlet and outlet valves permit servicing of the pump without emptying the entire system. Inlet piping must not slope toward the pump in such a way as to cause formation of an air pocket ahead of the pump. An inlet valve will serve to keep the inlet line full. This is particularly important with low viscosity fluids and with frequent starts and stops. With low absolute inlet pressure a check on the outlet side of the pump prevents backflow and minimizes start-up differential pressure.

ATTENTION

CAUTION
OPERATION OF THE PUMP WITH
INLET AND/OR OUTLET VALVES
IN THE CLOSED POSITION CAN CAUSE
DAMAGE TO THE PUMP

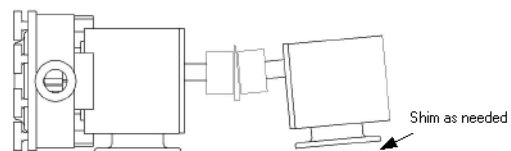
4. Welding of fittings is not recommended since warpage can occur which may affect pump operation and performance.
5. Overpressure protection must be provided for this pump. A pump-mounted pressure relief valve, a torque limiting device on the drive or a rupture disc in the discharge piping are examples. If pump rotation is to be reversed, pressure protection must be provided on both sides of the pump.



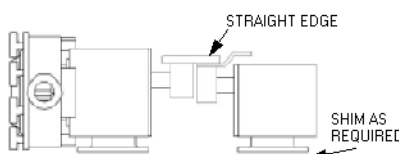
WARNING
DO NOT OPERATE PUMP UNLESS
OVER-PRESSURE PROTECTION IS
INSTALLED IN DISCHARGE
PIPING

6. Inlet side strainers or traps can be used to prevent foreign objects from entering and damaging the pump. Selection should be made based on viscosity to prevent clogging and restricting the inlet thus causing cavitation and reduction of flow from the pump.
7. Installation of pressure and/or vacuum gauges at inlet and/or outlet provide a convenient way to assess pump operation. Such gauges can indicate if pressure is normal or not, show changes in pump or system conditions, and provide indications of flow and changes in viscosity.
8. Pumps and drives ordered from the factory on a common base plate have been supplied with a flexible coupling and aligned before shipping. This alignment should be rechecked after the pump is installed and piping is complete.

Using feeler gages check angular alignment in four places around the coupling. The alignment and space between the couplings should be set to the manufacturer's recommended distance. Shim as needed.



Using a straight edge check parallel alignment as shown. Shim height as needed

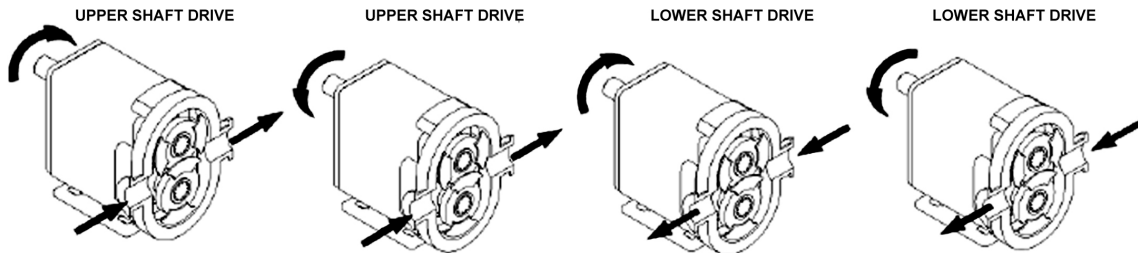


9. Turn pump shaft manually to make sure that the pump turns freely.



WARNING
DO NOT PUT FINGERS IN PORTS OF
NEAR ROTATING MEMBERS

10. Jog motor and observe motor coupling to make sure pump will turn in the right direction.



WARNING
STAY CLEAR OF MOTOR SHAFT
AND COUPLING WHEN JOGGING
MOTOR

11. Lock out power to pump.



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12. Connect coupling halves and install coupling guard.



WARNING
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WITHOUT GUARDS IN PLACE



WARNING
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13. Make sure inlet and outlet connections are tightened. If pump has double seals connect seal flushing piping. These connections are normally 1/8" female pipe threads. Liquid used for flushing is thereby connected of the seals and discharged to drain on the opposite side. Flow should be about 1/4 gpm, but may be increased for high temperature applications, but should be kept as near to 1/4 gpm as possible to avoid seal damage.

14. Lubrication

Gears are lubricated with Micro-Plate #140 oil for top or bottom shaft mounting position and oil is added at the factory.

OIL CAPACITY			
Model	Top or Bottom Shaft Mount	Side	Mount
0060	1.3 oz (40 ml)	3.3 oz (100 ml)	
0150	1.3 oz (40 ml)	3.3 oz (100 ml)	
0180	1.3 oz (40 ml)	3.3 oz (100 ml)	
0300	2 oz (60 ml)	4 oz (120ml)	
0450	6 oz (170 ml)	9.5 oz (280 ml)	
0600	6 oz (170 ml)	9.5 oz (280 ml)	
1300	6 oz (170 ml)	9.5 oz (280 ml)	
1800	11 oz (320 ml)	20 oz (600 ml)	
2200	11 oz (320 ml)	20 oz (600 ml)	
3200	17 OZ (500 ML)	44 OZ (1300 ML)	

Bearings are greased with Micro-Plate Moly grease. Grease bearings after every 250 hours of operation; change oil every 500 hours. Where moisture and/or condensation are heavy change oil and grease more frequently. If temperature is 5° F or below bearings should be greased with silicon grease.


STARTUP CHECKLIST


- Has protection from high pressure been considered ? See page 6.
- Are pump and all piping clean and free of foreign material, gaskets, weld slag, bolts etc.? **DO NOT USE PUMP TO CLEAN SYSTEM.**
- Are connections tightened and leak free?
- Is gear drive properly lubricated? See above.
- Are all guards in place and secure?
- Have seals requiring flushing been supplied with an adequate supply of clean flushing fluid?
- Are all valves open on the discharge side of the pump?
- Are all valves open on the inlet side of the pump, and is the material to be pumped reaching the pump?
- Is direction of rotation correct? See page 7.
- Jog or start pump at low speed when possible.

Check to see that pump is performing properly within several minutes. If problems are detected see Troubleshooting Guide starting on page 21.

CLEANING AND MAINTENANCE

Wright Pump products are designed for easy removal of the cover, rotors and seals for cleaning when necessary. Disassembly and assembly of the pump head and seals starts on page 13.

 **WARNING**
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OUT

 **WARNING**
RELIEVE SYSTEM PRESSURE BEFORE
REMOVING COVER OR PORT
CONNECTIONS

ATTENTION **CAUTION**
HANDLE ALL PARTS WITH CARE
TO AVOID NICKS AND SCRATCHES
WHICH MAY AFFECT
PUMP OPERATION

CLEANING

Clean per established procedures. Be aware of the cleaning solution used (see MSDS), and of cleaning solution temperature. Make sure no residual cleaning solution stays in the pump.

Note that acidic cleaners have a high metal corrosion rate, so pump parts should be exposed to these cleaners no longer than necessary and be completely rinsed.

PREVENTIVE MAINTENANCE

Simple inspection during cleaning will often detect signs of a problem before it becomes serious so that it can be corrected at minimal cost and down-time.

Remove rotors as described on page 12. Visually inspect rotor wing tips for signs of metal to metal contact. If present the pump should be repaired or replaced.

Possible causes:

Worn shaft keyway---replace shaft

Worn rotor keyway---replace rotor (usually both parts wear, often due to running a loose rotor)

Loose or worn gears, key, keyway shaft—inspect and replace as needed

Visually inspect the rotor hub where it contacts the shoulder on the shaft for wear.

Possible cause:

Running loose rotor—replace rotor and correctly tighten or re-shim shaft to maintain back-face clearance

Inspect shoulder on shaft for wear

Possible cause:

Running loose rotor—replace or re-shim shaft

Check gear backlash. There should be no free movement of either shaft.

Possible causes:

Worn gear teeth—replace gear

Gear loose on shaft—remove gear, inspect key, keyways and shaft. Replace worn parts and retighten.

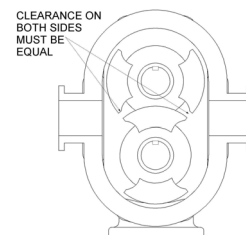
Check condition of bearings. Hand load (about 30 lbs.) each shaft. There should be no detectable movement.

Cause of movement:

Bearings worn due to lack of lubrication or overload---replace bearings and ensure adequate lubrication, reduce hydraulic load.

If gear box disassembly is required see instruction starting on page 16.

See page 14 for rotor installation. When pump is assembled there must be equal clearance as shown.

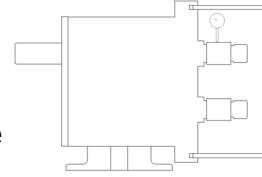


Follow lubrication intervals as shown on page 8.

ANNUAL MAINTENANCE

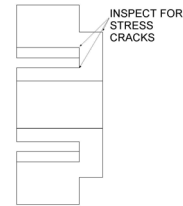
Conduct the same checks as above, and in addition do the following:

1. Check bearings for radial play using a dial indicator as shown. If indicator reading is equal or greater than the rotor-to-body clearance in the table on page 21, replace bearings.



2. Drain oil, remove gear box cover and inspect gears for wear and looseness. Retighten as needed.

3. Carefully inspect rotors visually for worn keyways splines, bearing shoulder wear, and for stress cracks. Replace worn or cracked rotors.



4. See table on page 20 and check radial and back face clearance to determine wear.

See instructions starting on page 12 for disassembly and assembly. When replacing bearings or shafts in the field care must be taken to properly shim the shaft to provide the correct clearances between the rotors, body and cover.

Operating speed adjustment can compensate for wear in some applications. When performance is no longer acceptable you may take advantage of the Wright Pump remanufacturing plan shown below.

FACTORY REMANUFACTURING PROGRAM:

This series of Wright Pumps may be remanufactured up to three times depending on use and wear. Remanufactured pumps are backed with the same warranty as a new pump. Factory remanufacturing involves body and cover remachining, new rotors, and replacement of all worn parts such as shafts, bearings, gears etc.

To facilitate the remanufacturing process, contact the factory to discuss the particular pump(s) to be remanufactured and obtain return goods authorization. It may be possible to supply a remanufactured pump in advance of returning a pump to the factory although not all sizes may be available at any one time. Be sure to clean and flush pump before returning it to the factory.

PUMP HEAD AND SEAL DISASSEMBLY AND ASSEMBLY

Before disassembly lock out power and release pressure from pump.



WARNING

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WARNING

RELIEVE SYSTEM PRESSURE BEFORE
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CONNECTIONS

ATTENTION

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PUMP OPERATION

1. Pump head disassembly

Remove cover nuts and cover. If necessary tap cover with soft hammer to loosen. Remove and discard cover “O” ring.

Insert a plastic or other soft dowel to block rotor **against pump body** when loosening rotor nuts. Loosen and remove nuts. Remove rotor nut “O” rings, Belleville washers and retaining “O” rings. Discard “O” rings.

Orient rotors perpendicular to each other, then remove rotor with both wings exposed first. If necessary use gear puller or hardwood lever to remove rotor from shaft. Remove and discard rotor hub “O” rings.

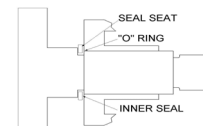
Remove body by pulling it straight off studs. Note that the pump body must be assembled to the same bearing housing from which it was removed.

2. Seal disassembly

Single Mechanical seal

Inner seal:

Remove seal from body. If chipped, scratched or evidence of cracks, discard seal. Remove and discard “O” rings.



Seal seat:

Remove seal seat from shaft. If chipped, scratched or evidence of cracks, discard seal. Make sure shoulder is clean; remove burrs if present; remove and discard "O" rings.

Double Mechanical Seal

Inner seal:

Remove seal from body. If chipped, scratched or evidence of cracks, discard seal. Remove wave spring. Remove and discard "O" rings.

Seal seat:

Remove seal seat from shaft. If chipped, scratched or evidence of cracks, discard seal. Make sure shoulder is clean; remove burrs if present; remove and discard "O" rings.

Outer seal:

Remove seal from body. If chipped, scratched or evidence of cracks, discard seal. Remove wave spring. Remove and discard "O" rings

3. Seal Assembly

Prior to reassembling the pump head inspect all parts to make sure they are free from damage. Nicks, scratches and cracks in mechanical seal components may cause seal leakage, and nicks, scratches and burrs on any pump part may cause leakage or performance problems.

Refer to sketches with disassembly instructions

Single mechanical seal

Seal seat:

Apply a suitable "O" ring lubricant to new "O" rings and insert them into shaft grooves.

Install seal seats, lining up the parallel flat surfaces on rear face with the shaft parallel surfaces.

Inner seal:

Assemble wave spring on seal and install into body in alignment with seal pins.

Apply an approved "O" ring lubricant to new "O" rings and insert them into the inner seal "O" ring grooves.

Lubricate seal faces.

Double mechanical seals

Seal seat:

Apply a suitable “O” ring lubricant to new “O” ring and insert into shaft groove furthest from spline.

Install seal seat lining up the parallel flat surfaces with the shaft parallel surfaces.

Inner seal:

Apply a suitable “O” ring lubricant to new “O” ring and insert into body groove.

Assemble wave spring on seal and install into body with notches engaging pins in body.

Outer seal:

Apply a suitable “O” ring lubricant to new “O” rings and install on outer diameter of seal.

Insert seal assembly into body engaging notches with pins and pushing from opposite side, over and in, to seat “O” ring.

Assemble wave spring on seal.

Apply lubricant to seal faces.

4. Pump Head Assembly

Slide body over shafts and studs taking care not to damage seal parts. Press body firmly against gear case engaging dowels.

Apply a suitable lubricant to new rotor hub “O” rings and install in grooves in rotor hubs. Slide rotors on to shafts. Align keyways and install keys.

Assemble Belleville washers into rotor nuts with cone of the washer pointing to the nut. Apply a suitable lubricant to washer new retaining “O” rings and insert into the rotor nuts to retain the washers. Make sure washer is not tight against the “O” ring.

Apply a suitable lubricant to the rotor nut “O” rings and install in each nut. Apply a suitable food grade anti-seize compound to the threads on each shaft, and thread the nuts onto each shaft.

Insert a plastic or other soft dowel to block rotor **against pump body**, then tighten each nut to the torque shown in the table below.

If rotor nuts are not tightened to the specified torque (listed below) they could come loose, causing damage to the pump.

Install a new cover “O” ring into cover groove, then install cover onto pump body. Apply a suitable anti-seize compound to the threads of the body studs and thread cover nuts on studs.

Tighten each nut to the torque shown in the table below. **If cover nuts are not tightened to the specified torque (listed below) body studs may break under high pressure.**

Sterilize pump in accordance with accepted sterilization procedures. Make sure no residual solution remains in the pump.

TORQUE VALUES

PUMP MODEL	ROTOR NUT TORQUE	COVER NUT TORQUE
0060	50 ft-lbs	7 ft-lbs
0150	50 ft-lbs	7 ft-lbs
0180	50 ft-lbs	7 ft-lbs
0300	120 ft-lbs	11 ft-lbs
0450	250 ft-lbs	56 ft-lbs
0600	250 ft-lbs	56 ft-lbs
1300	250 ft-lbs	56 ft-lbs
1800	325 ft-lbs	110 ft-lbs
2200	325 ft-lbs	110 ft-lbs
3200	320 ft-lbs	158 ft-lbs

GEAR BOX DISASSEMBLY AND ASSEMBLY



WARNING

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OUT

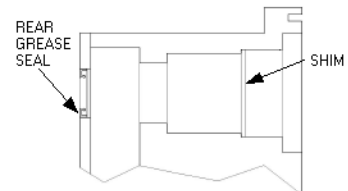


WARNING

RELIEVE SYSTEM PRESSURE BEFORE
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CONNECTIONS

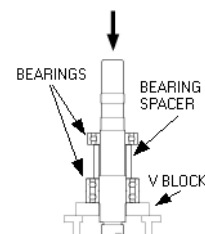
1. Remove pump head as shown starting on page 12 and drain oil from gear box.
2. Remove cap screws. Remove cover using soft hammer to loosen.
3. Scrape sealant from gear box and cover.
4. Remove oil seal from cover using an arbor press. Discard seal.
5. Using hammer and drift pin, straighten locking tab on lock washers.
6. Prevent shafts from turning by wedging a wooden block between the gears.
7. Use a spanner wrench or drift pin to remove the gear lock nuts.
8. When removing shafts make sure shaft ends are protected.
9. Remove front bearing retainer bolts and retainers. Remove sealant from retainers and gear box. (Retainer will press out when shaft is removed if it is stuck in place.)
10. Place gear box on arbor press with pump head end down. Protect shaft ends with a wooden block and press shafts out of gear box.

11. Remove sealant from bearing retainers, press out and discard grease seals.



12. Remove shims. If they will be reused identify the shaft on which they were used. Press out and discard rear grease seals.

13. Use hydraulic press and V blocks to remove bearings and spacer.



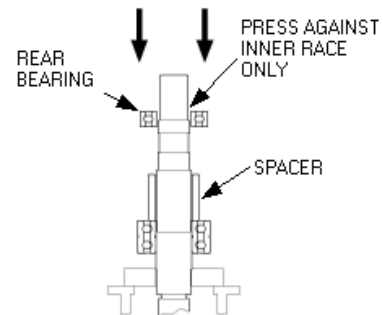
GEAR BOX ASSEMBLY

1. Coat front bearing area of shaft with Micro-Plate grease and position shaft in hydraulic press with spline down.

2. Place front bearing over shaft with shield side down. Press onto shaft until bearing is seated against shoulder. Place bearing spacer over shaft to seat on front bearing.

3. Coat rear bearing area on shaft with Micro-Plate grease. Slide rear bearing over shaft with shield side down. Press bearing onto shaft until it seats against spacer.

For both front and rear bearing as described in 2 and 3 above shields must face bearing spacer.



4. Wright pumps have close running tolerances to provide efficient operation. The position of the rotors is controlled by the use of shims behind the front bearing in the gear box. These shims control both the backface clearance between the rotors and the bottom of the rotor pocket in the housing and the clearance between the rotors and the cover. See page 20 for these dimensions. Clearance for both rotors should be equal to avoid rotor to rotor contact. To establish the correct shim thickness make the following measurements in 0.001 inches:

- A. Measure body width.
- B. Measure depth of rotor bore.
- C. Measure distance from gear box face to bottom of front bearing pocket in gear box.
- D. Slide rotor onto shaft and measure from back of rotor to back of front bearing.

Do calculations shown on page 19.
Calculations for shim thickness:

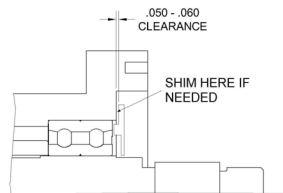
$$A - B = X$$

$$C + X = Y$$

$$(Y - D) + \text{required backface clearance (from page 20)} = \text{shim thickness.}$$

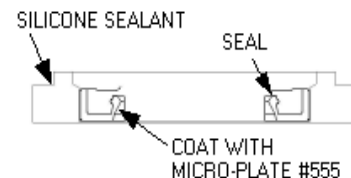
Repeat measurements for second rotor.

5. Place shim stock in the required thickness against shoulder in the bearing bore.
6. Place gearbox on arbor press with front (pump) end up. Place shaft assemblies in gear box with spline end up and with shafts in the correct location to provide top or bottom drive as required. Press shafts into housing until bearing is seated against shims.
7. Place body on gear box, making sure it is firmly seated. Install rotors on shafts. Secure with rotor retaining nuts: tighten first nut on shaft by striking nut wrench with soft faced hammer, then tighten second nut against first in the same way to jam nuts together. Check back face clearance against value on page 20. If necessary remove rotors, then remove shafts to adjust shim thickness.
8. When back face clearance has been established in accordance with the value shown on page 20, remove body and secure shaft assemblies in the gear box with bearing retainers. Do not apply sealant at this time. Retainers must seat firmly against the bearing and leave .050-.060" clearance between retainer and gear box. Use shims if needed to obtain this clearance.

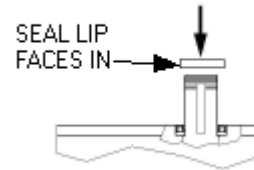


9. Make sure backface clearance is correct. Remove bearing retainers and grease both front and rear bearings through grease fittings until grease is visible around ball assemblies.

10. Install grease seals in bearing retainers. Coat seal lips with Micro-Plate #555 grease. Coat retainer flanges with silicone sealant. Install retainers.



11. Install rear oil seals and rear gear spacers.
12. Place keys in shaft key slots. Slide gear with single punch mark onto drive shaft. Slide gear with 2 punch marks onto short shaft with punch marks aligned on each side of single mark on drive gear.
13. Install lockwashers and lock nuts onto shafts. Tighten lock nut with spanner wrench. Bend locking tab on lockwasher to secure,
14. Press in rear seal with lip facing inward.
15. Place silicone sealant on back of gear case and mount cover assembly on case.
16. Fill gear case with oil as specified on page 8.



Assemble pump head as shown starting on page 13.

NOTES

REFERENCE TABLES

(Values in inches)

Standard Rotor Clearances

MODEL	BACK FACE CLEARANCE	ROTOR TO BODY CLEARANCE	FRONT FACE CLEARANCE
0060	0.002	0.002	0.005
0150	0.002	0.002	0.005
0180	0.002	0.002	0.005
0300	0.002	0.002	0.005
0450	0.004	0.005	0.008
0600	0.004	0.005	0.008
1300	0.004	0.005	0.008
1800	0.005	0.006	0.008
2200	0.005	0.006	0.008
3200	0.005	0.010	0.011

For non-standard rotor clearances contact Wright Pump at 1-262-650-1925.

CARE OF STAINLESS STEEL

Stainless steel components used in products made by Wright Pump are produced using methods that preserve the corrosion resistant property of stainless steel. The following precautions must be observed in use and cleaning to maintain corrosion resistance:

1. Hydrochloric acid, even with added inhibitors, is NOT recommended for cleaning due to its corrosion producing properties.
2. Pitting can occur when stray electrical currents contact wet stainless. Check electrical devices on a regular basis for improper grounding, damaged insulation or other defects that might cause stray currents.
3. Objects in contact with stainless steel prevent the air from drying and reforming the protective oxide film on the stainless, therefore don't leave tools, rubber mats etc. in contact with stainless pump components.
4. Utilize conditioned water where necessary to prevent foreign matter in the water from causing pitting or deposits that may prevent thorough cleaning.
5. Immediately rinse equipment with warm water after use, then clean as soon as possible. Pitting may occur under particles of product left on pump surfaces.
6. Use only recommended cleaning compounds from reputable suppliers, and use only as specified by the manufacturer, to prevent pitting, stress cracking and surface discoloring.
7. Scratches and metal particles embedded into stainless may cause corrosion over time. Use only non-metallic brushes and pads for hand cleaning.

8. Chemical bactericides must be used at the lowest permissible concentration, temperature and time. Follow directions supplied by the manufacturer and local health authority. Chlorine and other halogens may destroy the protective film while increased temperatures increase chemical activity which accelerates corrosion. Inspect joints for properly sealed gaskets in joints; crevices caused by improperly seated gaskets will promote crevice corrosion, particularly in the presence of chlorine.

9. Check all equipment for evidence of pitting and discolored surfaces and for stress cracks. Remove deposits and color from surfaces immediately using mild scouring powder and detergents. Rinse thoroughly and air dry to promote reformation of the protective oxide film.

TROUBLESHOOTING GUIDE

A properly sized and installed pump should provide trouble free operation, however problems in pumping systems may occur over time. The following information may help in identifying and resolving such problems:

PROBLEM	POSSIBLE CAUSE(S)	SOLUTION(S)
Pump not turning	Drive motor not running	Check circuit breakers, fuses
	Keys sheared or missing	Replace keys
	Drive belts, etc slipping or broken	Adjust or replace
	Shaft or gears sheared	Replace
No flow, pump turning	Rotation in wrong direction	Reverse rotation
No flow, pump not priming	Inlet valve closed	Open valve
	Inlet line clogged	Clean line and filters
	Air leaks because of bad seals and/or pipe connections	Replace seals, pressurize lines to check for leakage
	Speed of pump too slow	Increase speed, fill inlet lines, install foot valve
	Liquid drains or siphons	Install foot or check valves
	Air lock due to fluids that may vaporize or allow gas to come out of solution	Install air bleed in lines near pump
	Excess clearance between rotors and body and cover	Increase pump speed, install foot valve, have pump rebuilt
	Net inlet pressure too low	Check Net Inlet Pressure Available at Pump and Net Inlet Pressure Required by Pump. Calculate system and modify inlet system as needed
No flow	With vacuum inlet system atmospheric "blow back" prevents pump from starting flow	Install check valve in discharge line
	Relief valve not properly adjusted, or held open by foreign material	Adjust or clear valve

Fluid vaporization (starved Pump inlet)	Filters, valves, inlet filters or lines clogged	Clean
	Inlet line too small or too long, too many valves or fittings, filter too small.	Make necessary changes
	Net Inlet Pressure Available at Pump too low	Increase level in source tank or pressurize tank Select larger pump with less inlet pressure required
Fluid vaporization (starved Pump inlet)	Viscosity of pumped fluid higher than anticipated	Reduce pump speed (lower flow will result) or modify system
	Temperature of fluid higher than anticipated	Provide cooling, reduce speed, modify system to increase available inlet pressure
Insufficient flow	Speed too low	Increase speed
	Air leaks because of bad seals and/or pipe connections	Replace seals, pressurize lines to check for leakage
Relief valve not adjusted or held	Adjust/clean	Open
	Flow diverted in system	Check system valves and controls
	Hot clearance rotors used with "cold" or low viscosity fluid	Replace with standard rotors
	Worn pump	Increase speed, remanufacture pump.
	Pressure too high	Modify system
Noisy operation	Cavitation due to high fluid viscosity, high vapor pressure or high temperature	Reduce speed and/or temperature, modify system
	Inlet Pressure Available less than Inlet Press Required	Modify System
	Air or gas in system due to system leaks	Fix leaks
	Dissolved gas or naturally aerated products	Reduce discharge pressure, reduce speed and/or temperature, modify system
	Rotor to body contact	Check back face and rotor to cover clearances and reshim as necessary Check for distortion of pump due to installation of piping. Reassemble Pump and/or re-install piping
	Pressure higher than pump is rated	Reduce pressure
	Worn bearings or gears	Replace as needed, ensure regular Lubrication
	Rotor to rotor contact noise due to twisted shaft, sheared keys, loose or mistimed gears, worn splines	Rebuild with new parts as needed
	Relief valve chattering	Readjust, repair or replace valve
	Drive train components	Lubricate, repair or replace as needed

Pump overheats, stalls, draws excessive current (trips breaker, blows fuses)	Higher viscous losses than anticipated	If pump is within rating increase drive size
	Pressure higher than anticipated	Reduce speed, increase line size
	Fluid colder than anticipated, high viscosity	Heat fluid, insulate and heat lines, increase running clearances
Pump overheats, stalls, draws excessive current (trips breaker, blows fuses)	Fluid sets up during shutdown	Insulate or heat lines, install recirculating or "soft start" drive, Flush with different fluid
	Fluids such as chocolate, latex build up on internal pump surfaces	Increase running clearances
Pump service life not as long as expected	Misalignment of drive and piping, excessive pump overhang	Align piping and drive
	Abrasive fluid	Use larger pump at slower speed
	Bearings and gears lack lubrication	Establish and follow lubrication schedule
	Speeds and pressures higher than pump is rated	Reduce speed and pressures by system modification
	Pump corrodes	Upgrade material used in pump

NOTES

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