

WEINMAN®

INSTALLATION AND OPERATION MANUAL WATER LUBRICATED VERTICAL TURBINE PUMPS



TYPE: VT

IMPORTANT!

*Read all instructions in this manual before operating pump.
As a result of Crane Pumps & Systems, Inc., constant product improvement program,
product changes may occur. As such Crane Pumps & Systems reserves the right to
change product without prior written notification.*

CRANE

A Crane Co. Company

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Bramton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

Form No. 118629-Rev. D

SAFETY FIRST!

Please Read This Before Installing Or Operating Pump. This information is provided for **SAFETY** and to **PREVENT EQUIPMENT PROBLEMS**. To help recognize this information, observe the following symbols:



IMPORTANT! Warns about hazards that can result in personal injury or indicates factors concerned with assembly, installation, operation, or maintenance which could result in damage to the machine or equipment if ignored.

CAUTION! Warns about hazards that **can or will cause minor** personal injury or property damage if ignored. Used with symbols below.

WARNING! Warns about hazards that can or will cause serious personal injury, death, or major property damage if ignored. Used with symbols below.



Hazardous fluids can cause fire or explosions, burns or death could result.



Extremely hot - Severe burns can occur on contact.



Biohazard can cause serious personal injury.



Hazardous fluids can cause hazardous pressure, eruptions or explosions could cause personal injury or property damage.

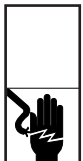


Rotating machinery Amputation or severe laceration can result.



Hazardous voltage can shock, burn or cause death.

Only qualified personnel should install, operate and repair pump. Any wiring of pumps should be performed by a qualified electrician.



WARNING ! To reduce risk of electrical shock, pumps and control panels must be properly grounded in accordance with the National Electric Code (NEC) or the Canadian Electrical Code (CEC) and all applicable state, province, local codes and ordinances. Improper grounding voids warranty.



WARNING! To reduce risk of electrical shock, always disconnect the pump from the power source before handling or servicing. Lock out power and tag.



WARNING! Operation against a closed discharge valve will cause premature bearing and seal failure on any pump, and on end suction and self priming pump the heat build may cause the generation of steam with resulting dangerous pressures. It is recommended that a high case temperature switch or pressure relief valve be installed on the pump body.



CAUTION ! Pumps build up heat and pressure during operation-allow time for pumps to cool before handling or servicing.



WARNING ! Do not pump hazardous materials (flammable, caustic, etc.) unless the pump is specifically designed and designated to handle them.



WARNING ! Do not wear loose clothing that may become entangled in moving parts.



WARNING ! Keep clear of suction and discharge openings. **DO NOT** insert fingers in pump with power connected.

Always wear eye protection when working on pumps.



Make sure lifting handles are securely fastened each time before lifting. **DO NOT** operate pump without safety devices in place. Always replace safety devices that have been removed during service or repair. Secure the pump in its operating position so it can not tip over, fall or slide.

DO NOT exceed manufacturers recommendation for maximum performance, as this could cause the motor to overheat.



WARNING ! To reduce risk of electrical shock, all wiring and junction connections should be made per the NEC or CEC and applicable state or province and local codes. Requirements may vary depending on usage and location.



WARNING! Products returned must be cleaned, sanitized, or decontaminated as necessary prior to shipment, to insure that employees will not be exposed to health hazards in handling said material. All Applicable Laws And Regulations Shall Apply.

Bronze/brass and bronze/brass fitted pumps may contain lead levels higher than considered safe for potable water systems. Lead is known to cause cancer and birth defects or other reproductive harm. Various government agencies have determined that leaded copper alloys should not be used in potable water applications. For non-leaded copper alloy materials of construction, please contact factory.



Crane Pumps & Systems, Inc. is not responsible for losses, injury, or death resulting from a failure to observe these safety precautions, misuse or abuse of pumps or equipment.

GENERAL INFORMATION

To The Purchaser:

Congratulations! You are the owner of one of the finest pumps on the market today. These pumps are products engineered and manufactured of high quality components. With years of pump building experience along with a continuing quality assurance program combine to produce a pump which will stand up to the toughest applications.

Check local codes and requirements before installation. Servicing should be performed by knowledgeable pump service contractors or authorized service stations.

Receiving:

Upon receiving the pump, it should be inspected for damage or shortages. If damage has occurred, file a claim immediately with the company that delivered the pump. If the manual is removed from the crating, do not lose or misplace.

Storage:

Short Term - Pumps are manufactured for efficient performance following long inoperative periods in storage. For best results, pumps can be retained in storage, as factory assembled, in a dry atmosphere with constant temperatures for up to six (6) months.

Long Term - Any length of time exceeding six (6) months, but not more than twenty four (24) months. The units should be stored in a temperature controlled area, a roofed over walled enclosure that provides protection from the elements (rain, snow, wind blown dust, etc.), and whose temperature can be maintained between +40 deg. F and +120 deg. F. Pump should be stored in its original shipping container and before initial start up, rotate impeller by hand to assure seal and impeller rotate freely.

Service Centers:

For the location of the nearest Weinman Service Center, check your Weinman representative or Crane Pumps & Systems, Inc., Service Department in Piqua, Ohio, telephone (937) 778-8947 or Crane Pumps & Systems Canada, Inc., Brampton, Ontario, (905) 457-6223.

SERVICE

Your Weinman In-Line Unipump requires no maintenance other than periodic inspection and occasional cleaning. The inspection is to prevent breakdown, thus obtaining optimum service life. The pump is lubricated by the liquid being pumped and therefore does not require additional lubrication. The motor, however, may require lubrication, in which case the motor manufacture's recommendation should be followed.

CAUTION! - You are working with powerful rotating machinery. Always use correct tools and extreme care when installing, adjusting or servicing this unit.



WARNING! - Failure to observe and follow these warnings could result in serious or even fatal bodily injury.



Remove and lock-out power to the driver before performing any maintenance or adjustment.



Never attempt to start or operate any part of this unit until all guards and shields are completely installed.



If pumping any fluid that could cause bodily injury (Hot water, Caustic, etc.) Always use eye protection and wear protective clothing over all exposed body areas when adjusting or servicing this unit.

CAUTION!

Due to the high speed at which the smaller size units may operate, and since most of the pumping unit is underground, extreme care must be used in assembly and installation. Thoroughly check the entire installation before operation.

If the pump is crooked, the water supply is doubtful, the water level has dropped, or the water contains considerable sand, gravel or gas, consult your supplier or installer before start-up.

Under no circumstances will Weinman guarantee the pump against the effects of corrosion, erosion or electrolytic action, those being entirely beyond our control.

In case any unusual vibration appears when starting or develops later, stop the pump. Locate and correct the cause of the vibration before starting again.

Failure to follow the above instructions or operation without proper submergence will VOID all express or implied warranties offered by Weinman.

SUMP

Measure the sump to make sure it is of ample size and depth to receive the pump.

FOUNDATION

A concrete foundation should be constructed before the pump is installed to permit aligning the pump head with the well while lifting equipment is available. Provide an opening in the foundation large enough for the top column flange with ample clearance. The foundation should be large enough to carry the weight of the pump without settling.

TOOLS

The following tools and equipment are required for satisfactory installation. Some equipment may not be required if pump is shipped fully assembled.

Derrick, gin pole with chain hoist, winch, or similar equipment with sufficient capacity to safely handle the weight of the complete unit.

TOOLS (Continued)

Two pipe clamps or pipe elevators of proper size for pump column.

Two chain pipe tongs (if the column has screwed couplings).

Two small pipe wrenches for screwing shaft together.

Small tools including wire brush, three-cornered file, wrenches, can of pipe compound, etc.

PREPARATION

Immediately on receipt of pump check carefully with packing list. Report any loss or damage to transportation company and to factory. Keep all parts in good dry storage. When ready to install, unpack material and lay out on skids or boxes near well.

Place the column pipe with the coupling end toward the sump. Check shafts for straightness. Roll on ways if any question as shafts must be almost perfectly straight. Place a shaft inside each length of column with the bearing sleeve toward the sump. Screw a shaft coupling on the opposite end.

Note — Short-coupled turbine pumps are usually shipped assembled except for mounting motor. To install these pumps it is only necessary to raise the pump over the sump or reservoir and lower it on foundation. Then mount motor or drive as explained later.

IMPORTANT NOTES

1. Column pipe threads are right hand; shaft threads are left hand.
2. Protect all parts from dirt; especially column and shaft threads, couplings, and all machined surfaces. Any dirt or foreign material between ends of shafts or other parts may cause misalignment and unsatisfactory operation.
3. Handle shaft with extreme care to avoid bending.
4. All shaft and column must butt solidly in couplings; otherwise, differences in length may develop during installation. Ends of shafts should be even with small hole in side of shaft coupling.

INSTALLING BOWL ASSEMBLY

If headroom permits, place strainer on suction bowl assembly before raising bowl assembly from ground. Then, if headroom permits, assemble the bottom section of the shaft and column pipe on the top of the bowl assembly. Raise the complete assembly, taking particular care not to place too much strain on the bowls. If necessary to place clamp on bowl assembly, make sure this is located over joint and not on the shell of a bowl.

Loosen clamp and lower assembly into the sump until the upper clamp or elevator rests on top of foundation.

INSTALLING COLUMN

Place clamp or elevator under coupling on upper end of the bottom section of column and raise over the sump. Support the shaft by hand or with a rope sling, taking particular care not to bend the shaft. On larger pumps a small clamp to fit the shaft or a length of manila rope will assist in supporting the shaft. Carry the lower end of the column or slide it on a plank so as not to damage threads. Make sure all threads are perfectly clean. Paint outside pipe threads with a good thread lubricant. Oil shaft threads and wipe off excess oil.

Screw the bottom shaft into the impeller shaft coupling and tighten. Then screw the column into the column adapter or if the adapter is flanged, bolt it to the top bowl. Lower the complete assembly into the sump and hold with clamp.

Place a bearing assembly over the shaft and slip it firmly in place in the column coupling.

Repeat this procedure until all of the column has been installed. Each section must butt rigidly in the couplings. Intermediate column lengths are regularly 10 feet for pumps up to 2,200 RPM and 5 feet for pumps to operate over 2,200 RPM. Rubber bearing should center in bearing sleeve in each column coupling. The top section of column has a flange for attaching to the discharge head. The top shaft which goes through the stuffing box is several inches longer than the top pipe.

INSTALLING HEAD ASSEMBLY

Hold the pump with clamps under the upper column coupling. This will support the top column flange several feet above the foundation where it is convenient to attach the discharge head. Remove the stuffing box assembly from the head. It may be necessary to bump it lightly with a wooden block. Place a double chain sling through the head and raise it over the pump. Make sure flange on lower side of head is clean and that studs are not damaged. Clean the top column flange and place paper gasket on it. Line up studs and the opening through the head with holes in top flange and lower the head carefully onto the top flange. Make sure the register fits and tighten stud nuts securely.

Then raise the complete pump assembly and remove the clamps. Rotate the unit until the discharge flange is in the desired direction and lower onto foundation. If the head does not rest evenly on the foundation, lift the unit and place metal shims under each corner. The head must be supported on the foundation so that it is in line with the column and shaft. **Never** level a pump head on the foundation with a spirit level.

Place paper gasket over stuffing box studs. Make sure the flange is clean and lower the stuffing box over the shaft using care not to damage packing. Tighten stud nuts securely and tighten gland nuts finger tight. Run stuffing box relief tube down through opening in head to return by pass water to the sump, or place tube through drain opening in back of head and pipe to drain. If pump is to operate under pressure; leave relief valve partially open to relieve the pressure on the upper packing. Use pressure grease gun to lubricate packing and stuffing box bearing. Screw headshaft coupling on upper end of stuffing box shaft. Place a cloth over coupling to avoid any possibility of dirt or foreign material dropping into it while motor is being mounted.

INSTALLING MOTOR OR DRIVE

Check motor nameplate to make sure it is suitable for the electric current available and the proper speed for the pump. Use eye bolts in top of motor for lifting motor only. **Do not** use these eye bolts for lifting motor and pump together. Set motor on pump head making sure that base of motor and top of head are clean and that register fits properly. Bolt motor in place with bolts or cap screws furnished. Remove motor canopy and top drive coupling. Lower headshaft through hollowshaft of motor with end of shaft having keyway at the top. Tighten in headshaft coupling. It is important that shafts butt in coupling but do not use excessive force which might cause misalignment.

ALIGNING PUMP

With motor drive coupling removed, check alignment of pump head on foundation by noting the clearance around the headshaft at top of motor. If the head-shaft stands to one side in hollowshaft, place metal shims between the head and foundation on the opposite side so that the headshaft will stand exactly in the center. The straightness of the headshaft, stuffing box shaft and coupling may be checked by installing the top drive coupling, raising the impellers and turning the rotating assembly 180°. Then remove the top drive coupling and the shaft should remain in the center of the hollowshaft. Raise the complete pump assembly and without moving the shims, spread a layer of cement on the foundation. Then let the pump down until it rests in exactly the same position as before. Recheck position of top shaft. After cement sets tighten foundation bolts.

CHECKING ROTATION

Have the motor wired and check rotation before installing the top drive coupling. Rotation must be counter clockwise when looking at top of motor. (See arrow on pump head.) Motors with built-in non-reverse ratchet may be energized momentarily without injury to the ratchet assembly. If rotation is incorrect, reverse two leads on three phase motor. Refer to diagram on single phase motor.

ADJUSTING IMPELLERS

Place top drive coupling over shaft and insert gib key. Tighten adjusting nut until impellers are raised off bowl seats and shaft just turns freely by hand. Then raise approximately one-third turn for each 10 feet of setting. It is better to raise more than necessary for starting and then make closer adjustment gradually. Install lock screw and tighten before starting pump. For maximum performance, impellers should be adjusted so that they run as close as possible and yet do not rub at maximum pressure. If there is any unusual noise or vibration, stop the pump and recheck impeller adjustment. A watt meter or ammeter may be used to obtain very close adjustment. If sump may contain sand, raise impellers about twice normal amount when first starting pump and then readjust after sump has cleared up. If the sump does not produce sufficient water to supply the pump, the capacity of the pump should be reduced by raising the impellers.

PRELUBRICATING AND STARTING PUMP

Where pumps operate frequently and the water level is less than 50 feet from the surface, the bearings will normally remain sufficiently moist for smooth starting without prelubrication. Where pumps are started infrequently, an electric solenoid operated valve should be installed in a pre-lube line with a timing relay to delay the starting of the pump until the bearings have been properly lubricated.

A gate valve should be placed in the discharge line. Leave this valve about three quarter closed when the pump is started. After the water reaches the surface, open the valve slowly to avoid over pumping the sump and to maintain normal discharge pressure on the pump. Check the stuffing box and tighten gland, if necessary, with a small wrench, until there is only a small trickle of water to keep the packing lubricated.

LUBRICATION

PUMP LINE SHAFT AND BOWL BEARINGS

On Model VT Water Lubricated Pumps, all bearings below ground are lubricated by the water flowing through the pump. Prelubrication during the starting period should be provided where necessary as explained above.

The water level in the sump should be checked occasionally while the pump is in operation. If the water level draws down below the bowls, additional column and shaft should be installed, or the capacity of the pump should be reduced by either raising the impellers or throttling the discharge. The pump must not be allowed to operate if the water level drops to the strainer and the pump breaks suction.

STUFFING BOX

Apply a small amount of a good E.P.A./F.D.A.- approved water resistant lubricant to the grease fitting on the stuffing box each time the pump is started or once a day if the pump is operated continuously. Special turbine stuffing box grease may be obtained from Weinman in 1-lb. cans

MOTOR

Always refer to and follow motor manufacturer's lubrication and maintenance instructions.

MOTOR WITH GREASE LUBRICATED BEARINGS (Lubricated at factory before shipment)

- A. Motor with grease fitting and drain plug in each bearing housing.

Once each six months or once a year, depending on operating conditions, the motor should be relubricated as follows:

1. Remove drain plug or grease ejector.

MOTOR WITH GREASE LUBRICATED BEARINGS (Continued)

2. Apply pressure gun to grease fitting and inject new grease until all old grease has been forced out of the bearing through the grease drain. If a grease ejector is supplied, assist flushing of old grease by slowly working the plunger back and forth several times to remove grease from the drain.
 3. Run motor for approximately five minutes to relieve bearing of excess grease using ejector immediately upon starting to assist removal of grease from drain.
 4. Replace drain plug or ejector.
- B. Motor with grease fitting only in each bearing housing.

Once each six months or once a year, depending upon operating conditions, add a small amount of grease. Then remove grease fitting and operate the motor about one-half hour before replacing the fitting to allow any excess grease to be expelled. The bearing may run warm (without injury) until the excess grease has been expelled. An approval motor bearing grease may be obtained from Weinman in 1-lb. cans

MOTOR WITH OIL LUBRICATED BEARINGS OR FLEXIBLE COUPLING DRIVE

Oil lubricated motors and drives are shipped without oil and should be filled with proper grade oil before starting. Check oil level once a week with pump idle. Change oil once a year or every 2,000 hours operation, whichever occurs first. Change oil more frequently for continuous operation or under dusty conditions. For proper turbine oils refer to table. While special turbine motor oil is preferred, if necessary a SAE10 or SAE20 non-detergent pure paraffin base motor oil may be used temporarily.

MOTOR WITH OIL LUBRICATED TOP BEARING AND GREASE LUBRICATED LOWER BEARING (Fill top oil reservoir before starting. Lower bearing greased at factory.)

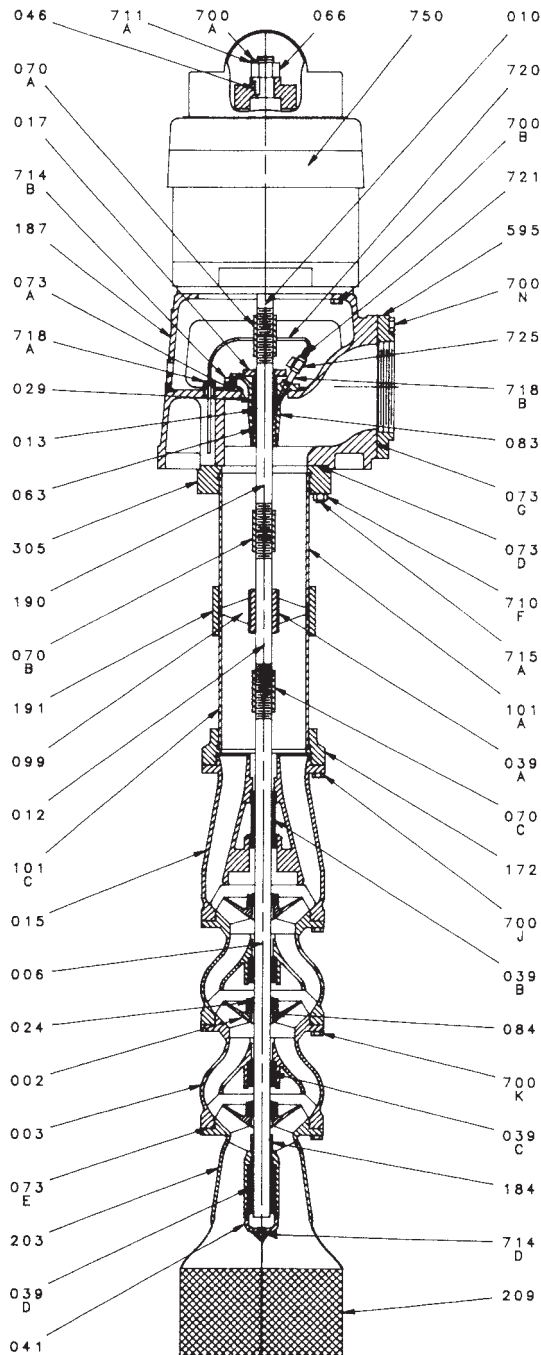
Relubricate according to instructions outlined above.

RECOMMENDED GREASES FOR MOTORS Trade Name of Grease

Conoco Race Lube	Chevron Industrial Grease, Medium
Andok Lubricant B	Sohio #78 or Lubtec Grease
Mobilux Grease #2	Sun N-52X
Alvania Grease #2	Regal Starfak #2
Veedol All-Purpose	

RECOMMENDED OILS FOR MOTORS				
ANGULAR CONTACT THRUST BEARINGS			SPHERICAL ROLLER THRUST BEARINGS	
AMBIENT TEMPERATURE RANG	UP TO 100°F	ABOVE 100°F TO A MAX OF 140°F	UP TO 40°F	ABOVE 40°F TO A MAX OF 140°F
OIL VISCOSITY	145 TO 175 SUS AT 100°F	275 TO 310 SUS AT 100°F	300 TO 400 SUS AT 100°F	500 TO 650 SUS AT 100°F
TYPICAL MANUFACTURES SPECIFICATIONS				
U.S. Electrical Motors	VISCOLUBE R772101	VISCOLUBE R772103	VISCOLUBE R772103	VISCOLUBE R772105
CITIES SERVICE OIL CO.	CITGO PACEMAKER 32	CITGO PACEMAKER 68	CITGO PACEMAKER 68	CITGO PACEMAKER 100
CONOCO INC.	CONOCO DECTOL 15R & 0 OIL	CONOCO DECTOL 33R & 0 OIL	CONOCO DECTOL 33R & 0 OIL	CONOCO DECTOL 51R & 0 OIL
EXXON CO. U.S.A	TERRESSTIC 33	TERRESSTIC 68	TERRESSTIC 68	TERRESSTIC 100
GETTY OIL CO.	VEEDOL ATURBRI0 50	VEEDOL ATURBRI0 60	VEEDOL ATURBRI0 60	VEEDOL ATURBRI0 70
GULF OIL CORP.	HARMONY 44	HARMONY 53	HARMONY 53	HARMONY 69
E.F. HOUGHTON & CO.	HYDRO-DRIVE MIH LIGHT	HYDRO-DRIVE MIH 20	HYDRO-DRIVE MIH 20	HYDRO-DRIVE MIH 30
KEYSTONE DIV. OF PENWALT CORP.	KLC or KLC-654A	KLC 4A or KLC-543	KLC 4A or KLC-543	KLC 4 or KLC-432
MOBIL OIL CORP.	DTE OIL LIGHT DTE 797	DTE OIL HEAVY MEDIUM	DTE OIL HEAVY MEDIUM	DTE OIL HEAVY HEAVY
PENNZOIL CO. INC.	AW HYD OIL 32	AW HYD OIL 68	AW HYD OIL 68	AW HYD OIL 100
SHELL OIL CO.	TELLUS 25	TELLUS 33	TELLUS 33	TELLUS 41
CHEVRON U.S.A. INC.	CHEVRON 0C TURBINE OIL 32	CHEVRON 0C TURBINE OIL 68	CHEVRON 0C TURBINE OIL 68	CHEVRON 0C TURBINE OIL 100
SUN OIL CO.	SUNVIS 916	SUNVIS 931	SUNVIS 931	SUNVIS 951
TEXACO INC.	REGAL 32	REGAL 68	REGAL 68	REGAL 150
UNION OIL CO. of CALIF.	UNAX AW 32	UNAX AW 68	UNAX AW 68	UNAX AW 100
VALVOLINE DIV. ASHLAND OIL, INC.	VALVOLINE ETC. OIL 15	VALVOLINE ETC. OIL 30	VALVOLINE ETC. OIL 30	VALVOLINE ETC. OIL 100

PARTS LIST - TYPE VT WATER LUBRICATED

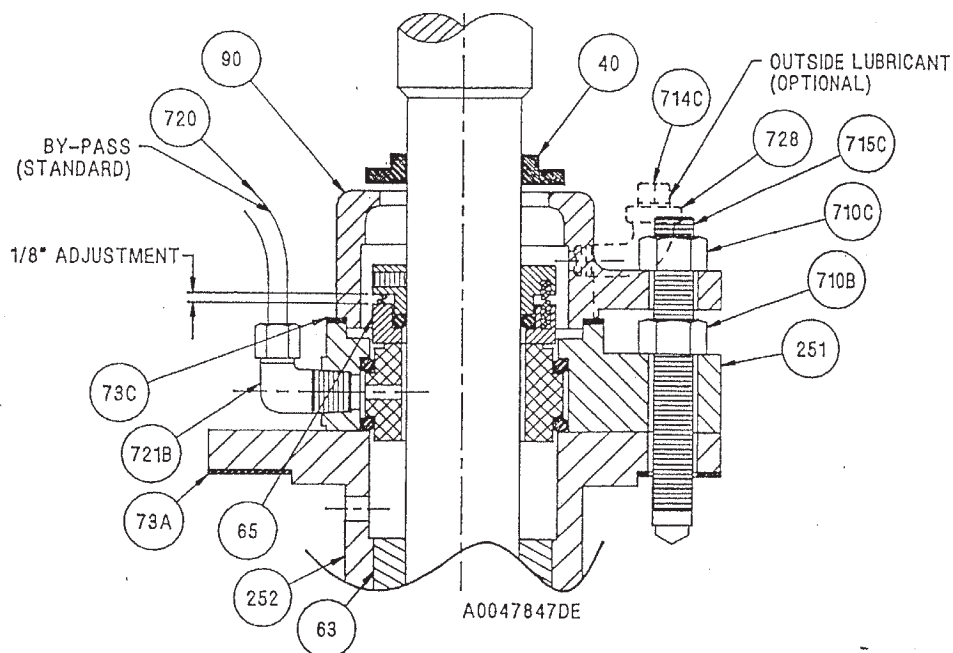


Pumps 15 feet or less are usually shipped unassembled. Pumps over 15 feet are usually shipped unassembled and must be assembled at time of installation. Motors and mechanical seals (if used) are not installed at the factory and must be mounted on the pump during installation. **When writing the factory regarding your pump, always include serial number.**

002	Impeller
003	Intermediate Bowl
006	Shaft, Impeller
010	Shaft, Head
012	Shaft, Intermediate
*013	Packing, Stuffing Box
015	Bowl, Discharge
017	Gland, Stuffing Box
024	Nut, Impeller
*029	Lantern Ring
*039A	Bearing, Column
*039B	Bearing, Discharge Bowl
*039C	Bearing, Intermediate Bowl
*039D	Bearing, Suction Bowl
041	Cap, Bearing
*046	Key, Gib
*063	Bearing, Stuffing Box
066	Nut, Shaft Adjusting
070A	Coupling, Head Shaft
070B	Coupling, Line Shaft
070C	Coupling, Impeller Shaft
*073A	Gasket, Stuffing Box
*073D	Gasket, Top Column Flange
*073E	Gasket, Bowl
*073G	Gasket, Companion Flange
083	Box, Stuffing
084	Collet, Impeller Lock
099	Housing, Bearing
101A	Pipe, Top Column
101B	Pipe, Intermediate Column - Not Shown
101C	Pipe, Bottom Column
172	Adapter, Column
184	Cap, Sand
187	Head, Discharge
190	Shaft, Stuffing Box
191	Coupling, Column
203	Bowl, Suction
209	Strainer
305	Flange, Top Column
595	Flange, Companion
700A	Screw, Lock
700B	Screw, Cap Motor
700C	Screw, Cap Stuffing Box - Not Shown
700J	Screw, Cap Discharge Bowl
700K	Screw, Cap Intermediate Bowl
700N	Screw, Cap Companion Flange
710C	Nut, Hex, Column Stuffing Box Gland - Not Shown
710F	Nut, Hex, Column Adapter
711A	Lockwasher
714B	Plug, Pipe Stuffing Box
714D	Plug, Pipe Suction Bowl
715A	Stud, Top Column Flange
715C	Stud, Stuffing Box Gland - Not Shown
718A	Nipple, Discharge Head
718B	Nipple, Stuffing Box
720	Tubing
721	Connector, Tubing
725	Pet Cock
750	Motor

(*) Recommended Spare Parts

Type RA mechanical seal - Addendum to Type VT Pumps Series



ITEM	DESCRIPTION	QTY
40	Slinger	1
63	Bearing, Seal Housing	1
65	Seal, Mechanical	1
73A	Gasket, Seal Housing	1
73C	Gasket, seal Housing Cover	1
90	Cover, Seal Housing	1
251	Gland, Seal	1
252	Housing, Seal	1

ITEM	DESCRIPTION	QTY
710B	Nut, Hex (Seal Gland/Housing)	6
710C	Nut, Hex (Seal Cover)	1
714C	Plug, Pipe (Seal Housing Cover)	1
715C	Stud, (Seal Gland/Housing) Not Shown	4
715C	Stud, All Thread (seal Cover)	2
720	Tubing, By-Passing	1
721B	Connector, Tubing (Straight)	1
728	Street Ell	1

Place gasket over seal housing studs. Make sure flange is clean. Smooth up any rough edges of shaft threads with emery cloth.

Refer to above seal drawing. Lower seal housing with bearing over shaft using care not to damage the shaft threads or bearing and press firmly in place.

Grease shaft lightly (use Silicone Lubricant provided) and slide carbon seal insert with "O" rings over shaft and into place on the seal housing with narrow surface of insert at top. **This surface is important:** it must not be scratched or chipped.

Set seal gland in place and arrange seal insert so that by-pass hole lines up with the opening in the seal gland. Tighten stud nuts and connect by-pass line.

Slide the seal ring, including shaft packing, into place.

Put collar in place, but **do not tighten the set screws until setting final seal clearance.**

Put gasket in place on top of seal gland.

Put seal housing cover in place

If pump is furnished with slinger, slide this over shaft and into place.

Do not put stud nuts holding seal housing cover in place until after impeller adjustment has been made and seal adjustment has been completed.

INSTALLING MOTOR OR DRIVE - INSTALL STEADY BUSHING ON MOTOR.

Check motor nameplate to make sure it is suitable for the electric current available and the proper speed for the pump. Use eye bolts in top of motor for lifting motor only. Douse these eye bolts for lifting motor and pump together. Set motor on pump head making sure that base of motor and top of had are clean and that register fits properly. Bolt motor in place with bolts or cap screws furnished. Remove motor canopy and top drive coupling. Lower headshaft through hollowshaft or motor keeping keyway end of shaft at top. Tighten in headshaft coupling. It is important that shafts butt in coupling but do not use excessive force which might cause misalignment.

CHECK ROTATION

Have the motor wired and check rotation before installing the top drive coupling. Rotation must be counter-clockwise when looking at top of motor. (See arrow on pump head.) If rotation is incorrect, reverse two leads on three phase motors.

ADJUSTING IMPELLERS

Place top drive coupling over shaft, insert gib key and bolt upper half coupling to lower half. Screw adjusting nut onto head shaft and tighten until impellers are just free and shaft may be turned by hand. Raise and adjust impellers by turning adjusting nut one hex more. Line up one of the drilled holes in the adjusting nut with one of the tapped holes in the top drive coupling. Insert lock screw and tighten to maintain impeller adjustment.

Use key stock as gauge for determining clearance in seal.

ADJUSTING SEAL AND STARTING PUMP

Adjust seal clearance in accordance with attached seal drawing, then secure seal housing cover in place with proper stud nuts. The pump is now ready to start. For maximum performance impellers should be adjusted so that they run as close as possible to the bowl seats and yet do not rub at maximum pressure. If there is unusual noise or vibration, stop the pump and recheck impeller adjustment. If impeller adjustment must be changed, release the seal tension. Then complete the change in impeller adjustment and readjust the seal tension with the clearance as explained above.

LUBRICATION

Pump Bearings - Pump bearings are lubricated by the liquid being handled by the pump. Liquid must be over the bottom impeller at all times. **This is extremely important on starting.**

MOTOR

See instructions on motor nameplate. Motors with grease lubricated bearings have had bearings lubricated at factory before shipment.

CHECKING OR REPLACING MECHANICAL SEAL

Pull open the safety switch to the motor.

Remove stud nuts holding seal housing cover.

Raise the seal housing cover and oil seal.

Check seal clearance in seal to be sure it is 1/8" per attached drawing. **Improper seal clearance can cause wear and seal leakage.**

Remove motor canopy adjusting nut, (observe impeller adjustment) top drive coupling, key, headshaft and headshaft coupling.

Disconnect by-pass line and remove this.

If there are any wrench marks on the shaft above the seal, smooth these with a file so that the seal will not be scored during removal. (Put cloth over seal so that no filings can get into the seal).

Release set screws in collar and remove collar and seal ring assembly.

Remove stud nuts and lift off the seal gland and seal insert with "O" rings.

If seal surfaces of ring and insert are only lightly scratched, they can be repair by lapping with a circular motion on very fine abrasive with a perfectly flat surface for support. A piece of plate glass provides a very good surface. Circular motion on news print laid on the glass will give a smooth finish tothe lapping operation. If surfaces are beyond repair, replace the complete mechanical seal.

If bearing is worn and must be replaced, remove seal housing, press out bearing and replace the new one.

Reinstall seal housing and seal, and readjust in accordance with installation instructions.

Note: It is of utmost importance that all seal parts be keep **perfectly clean** and **handled carefully** so as to avoid damage to the seal surfaces.

BARNES®**burks®****WEINMAN®****DEMING®****PROSSER®**

Limited 24 Month Warranty

Crane Pumps & Systems warrants that products of our manufacture will be free of defects in material and workmanship under normal use and service for twenty-four (24) months after manufacture date, when installed and maintained in accordance with our instructions. This warranty gives you specific legal rights, and there may also be other rights which vary from state to state. In the event the product is covered by the Federal Consumer Product Warranties Law (1) the duration of any implied warranties associated with the product by virtue of said law is limited to the same duration as stated herein, (2) this warranty is a LIMITED WARRANTY, and (3) no claims of any nature whatsoever shall be made against us, until the ultimate consumer, his successor, or assigns, notifies us in writing of the defect, and delivers the product and/or defective part(s) freight prepaid to our factory or nearest authorized service station. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply. **THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY AND ALL WARRANTIES WITH RESPECT TO ANY PRODUCT SHALL BE TO REPLACE OR REPAIR AT OUR ELECTION, F.O.B. POINT OF MANUFACTURE OR AUTHORIZED REPAIR STATION, SUCH PRODUCTS AND/OR PARTS AS PROVEN DEFECTIVE. THERE SHALL BE NO FURTHER LIABILITY, WHETHER BASED ON WARRANTY, NEGLIGENCE OR OTHERWISE.** Unless expressly stated otherwise, guarantees in the nature of performance specifications furnished in addition to the foregoing material and workmanship warranties on a product manufactured by us, if any, are subject to laboratory tests corrected for field performance. Any additional guarantees, in the nature of performance specifications must be in writing and such writing must be signed by our authorized representative. Due to inaccuracies in field testing if a conflict arises between the results of field testing conducted by or for user, and laboratory tests corrected for field performance, the latter shall control. **RECOMMENDATIONS FOR SPECIAL APPLICATIONS OR THOSE RESULTING FROM SYSTEMS ANALYSES AND EVALUATIONS WE CONDUCT WILL BE BASED ON OUR BEST AVAILABLE EXPERIENCE AND PUBLISHED INDUSTRY INFORMATION. SUCH RECOMMENDATIONS DO NOT CONSTITUTE A WARRANTY OF SATISFACTORY PERFORMANCE AND NO SUCH WARRANTY IS GIVEN.**

This warranty shall not apply when damage is caused by (a) improper installation, (b) improper voltage (c) lightning (d) excessive sand or other abrasive material (e) scale or corrosion build-up due to excessive chemical content. Any modification of the original equipment will also void the warranty. We will not be responsible for loss, damage or labor cost due to interruption of service caused by defective parts. Neither will we accept charges incurred by others without our prior written approval.

This warranty is void if our inspection reveals the product was used in a manner inconsistent with normal industry practice and/or our specific recommendations. The purchaser is responsible for communication of all necessary information regarding the application and use of the product. **UNDER NO CIRCUMSTANCES WILL WE BE RESPONSIBLE FOR ANY OTHER DIRECT OR CONSEQUENTIAL DAMAGES, INCLUDING BUT NOT LIMITED TO TRAVEL EXPENSES, RENTED EQUIPMENT, OUTSIDE CONTRACTOR FEES, UNAUTHORIZED REPAIR SHOP EXPENSES, LOST PROFITS, LOST INCOME, LABOR CHARGES, DELAYS IN PRODUCTION, IDLE PRODUCTION, WHICH DAMAGES ARE CAUSED BY ANY DEFECTS IN MATERIAL AND/OR WORKMANSHIP AND/OR DAMAGE OR DELAYS IN SHIPMENT. THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY OTHER EXPRESS OR IMPLIED WARRANTY, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.**

No rights extended under this warranty shall be assigned to any other person, whether by operation of law or otherwise, without our prior written approval.

CRANE®*A Crane Co. Company*

PUMPS & SYSTEMS

420 Third Street
Piqua, Ohio 45356
Phone: (937) 778-8947
Fax: (937) 773-7157
www.cranepumps.com

83 West Drive, Brampton
Ontario, Canada L6T 2J6
Phone: (905) 457-6223
Fax: (905) 457-2650

IMPORTANT!
WARRANTY REGISTRATION

Your product is covered by the enclosed Warranty.
To complete the Warranty Registration Form go to:

<http://www.cranepumps.com/ProductRegistration/>

If you have a claim under the provision of the warranty, contact your local
Crane Pumps & Systems, Inc. Distributor.

RETURNED GOODS

**RETURN OF MERCHANDISE REQUIRES A "RETURNED GOODS AUTHORIZATION".
CONTACT YOUR LOCAL CRANE PUMPS & SYSTEMS, INC. DISTRIBUTOR.**



**Products Returned Must Be Cleaned, Sanitized,
Or Decontaminated As Necessary Prior To Shipment,
To Insure That Employees Will Not Be Exposed To Health
Hazards In Handling Said Material. All Applicable Laws
And Regulations Shall Apply.**

Notes

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.