



OPERATING INSTRUCTIONS & PARTS MANUAL

WATER CIRCULATING PUMPS

MODELS 1P899A THRU 1P903A, 2P432 THRU 2P436, 2P609 THRU 2P612, 3P701 & 3P702

FORM 5S1375 01782

0488/119/5M

READ INSTRUCTIONS CAREFULLY BEFORE ATTEMPTING TO INSTALL, OPERATE, OR SERVICE TEEL PUMPS. PROTECT YOURSELF AND OTHERS BY OBSERVING ALL SAFETY INFORMATION AND ADDITIONAL INSTRUCTIONS INCLUDED WITH THIS EQUIPMENT. FAILURE TO COMPLY WITH INSTRUCTIONS COULD RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE! RETAIN INSTRUCTIONS FOR FUTURE REFERENCE.

Description

Teel water circulating pumps are designed for in-line multi-stage zoning applications in hydronic heating and cooling systems for residential, commercial and/or industrial applications. May also be utilized in domestic water pressure systems and OEM equipment requiring circulation of liquids. All models have radially split pump bodies; pump body can remain in line during repair or maintenance, no need to disconnect piping when servicing.

Pump should be used with liquid compatible with pump construction materials.

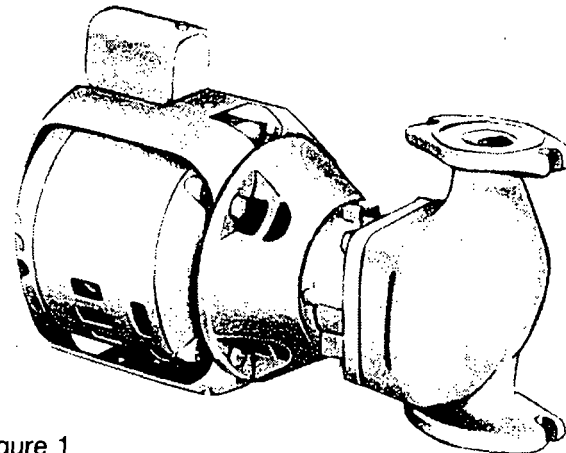


Figure 1

WARNING: DO NOT USE TO PUMP FLAMMABLE EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC., OR IN EXPLOSIVE ATMOSPHERES. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PROPERTY DAMAGE OR PERSONAL INJURY.

Unpacking

When unpacking the unit, inspect for any damage that may have occurred during transit. Check for loose, missing or damaged parts.

Pump Construction

PART	MODEL			
	1P903A 2P432, 2P609	1P899A, 1P900A 1P901A, 1P902A 2P433	2P434, 2P435 2P610, 2P611	2P436, 2P612, 3P701, 3P702
BODY	Bronze	Cast iron	Cast iron	Cast iron
IMPELLER	Brass*	Plated steel*	Brass	Bronze
IMPELLER NUT	Brass	Plated steel	Brass	Brass
IMPELLER WASHER	Copper	Plated	Brass	Brass
SEAL PLATE	Brass	Plated Steel	Plated steel	—
SHAFT	Alloy steel	Alloy steel	Alloy steel	Alloy steel
SEAL SPRING	Type 316 stainless steel	Type 316 stainless steel	Type 316 stainless steel	Type 316 stainless steel
SEAL SEAT	Ceramic	Ceramic	Ceramic	Ceramic
SEAL RING	Carbon	Carbon	Carbon	Carbon
SEAL SLEEVE	Copper	Copper	Copper	Copper
SEAL ELASTOMER	Buna N	Buna N	Buna N	Buna N
COVER PLATE	—	—	—	Cast Iron

*1P899A and 1P903A have polypropylene/40% glass-filled impellers. 1P900A, 2P432 and 1P901A have Noryl impellers.

Specifications

MODEL	HP 1725 RPM	VOLTS	PH.	F/L AMPS	THERMAL PROTECTION	DIMENSIONS			
						FACE TO FACE	WIDTH	LENGTH	FLANGE SIZES
1P899A	1/12	115	1	2.5	Auto	6 ⁵ / ₁₆ "	5 ³ / ₄ "	13 ¹ / ₄ "	3/4"-1"-1 ¹ / ₄ "-1 ¹ / ₂ "
1P900A	1/6	115	1	3.6	Auto	8 ¹ / ₂	6	15 ³ / ₈	1-1 ¹ / ₄ -1 ¹ / ₂
1P901A	1/6	115	1	3.6	Auto	8 ¹ / ₂	6 ⁵ / ₈	15	2
1P902A	1/6	115	1	3.6	Auto	8 ¹ / ₂	6 ⁷ / ₁₆	15 ¹ / ₄	1
1P903A	1/12	115	1	2.5	Auto	6 ⁵ / ₁₆	5 ³ / ₄	13 ¹ / ₄	3/4-1-1 ¹ / ₄ -1 ¹ / ₂
2P432	1/6	115	1	3.6	Auto	8 ¹ / ₂	6	15 ¹ / ₂	1-1 ¹ / ₄ -1 ¹ / ₂
2P433	1/4	115	1	5.0	Auto	10 ¹ / ₄	7 ¹ / ₄	16 ¹ / ₄	2 ¹ / ₂
2P434	1/4	115	1	5.0	Auto	12	7 ¹ / ₂	16 ¹ / ₄	1
2P435	1/2	115/208-230	1	8.4/4.2*	Auto	12	7 ¹ / ₂	18 ³ / ₈	1 ¹ / ₂
2P436	3/4	115/208-230	1	9.8/4.9*	Auto	13 ⁵ / ₈	9 ¹ / ₄	22 ¹ / ₂	1 ¹ / ₂
2P609	1/6	115	1	3.6	Auto	8 ¹ / ₂	6 ⁷ / ₁₆	15 ¹ / ₄	1
2P610	1/3	115	1	5.4	Auto	11 ¹ / ₂	8 ¹ / ₂	17 ¹ / ₄	1 ¹ / ₄
2P611	3/4	208-230/460	3	2.8-2.9/ 1.45	Manual	11 ¹ / ₂	8 ¹ / ₂	18	2
2P612	1/2	115/208-230	1	8.4/4.2	Auto	13 ¹ / ₂	9 ³ / ₄	20 ¹ / ₂	1 ¹ / ₂
3P701	1	208-230/460	3	3.5-3.6/ 1.8	Manual	13 ¹ / ₂	9 ³ / ₄	21 ¹ / ₂	1 ¹ / ₂
3P702	1 ¹ / ₂	208-230/460	3	4.8-4.8/ 2.4	Manual	14	9 ³ / ₄	21 ³ / ₄	2

* Full-load amps at 115/230 volts.

Performance

FLOW RATE IN GPM BASED ON MAXIMUM PIPE SIZE																	
MODEL	TOTAL HEAD IN FEET																SHUT OFF
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1P899 & 1P903	30	28	25	23	18	14	8	0	—	—	—	—	—	—	—	—	9
1P900 & 2P432	—	—	—	—	38	35	30	26	20	15	7	0	—	—	—	—	13
1P901	69	65	61	57	53	48	42	36	27	20	0	—	—	—	—	—	12
1P902 & 2P609	—	—	—	—	—	25	24	23	22	21	18	16	13	11	8	0	17
2P433	110	105	101	96	91	86	79	74	67	59	50	41	30	14	0	—	16
TOTAL HEAD IN FEET																	
	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	
2P434	42	38	35	31	27	21	13	0	—	—	—	—	—	—	—	—	24
2P610	53	51	47	44	38	34	27	17	—	—	—	—	—	—	—	—	26
2P435	—	—	78	72	66	58	50	41	28	14	—	—	—	—	—	—	29
2P611	—	—	—	97	92	85	75	63	48	20	—	—	—	—	—	—	29
2P612	—	—	—	—	48	46	43	41	38	36	31	23	0	—	—	—	34
TOTAL HEAD IN FEET																	
	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	
2P436	57	56	54	52	50	47	42	39	34	27	18	—	—	—	—	—	45
3P701	—	—	—	—	63	61	59	56	53	49	45	41	36	30	22	0	54
3P702	137	131	126	119	112	106	97	90	81	70	58	41	—	—	—	—	47

NOTE: All single phase motors thermal protected. Three phase motors require external overload protection.

Max. Operating Temp. 225°F
 Max. Operating Pressure: Models 1P899A-1P903A, 2P432, 2P433 & 2P609 125 PSI
 Models 2P434-2P436, 2P610-2P612, 3P701 & 3P702 175 PSI

General Safety Information

1. Know the pump application, limitations and potential hazards.

WARNING: DO NOT USE TO PUMP FLAMMABLE OR EXPLOSIVE FLUIDS SUCH AS GASOLINE, FUEL OIL, KEROSENE, ETC. DO NOT USE IN EXPLOSIVE ATMOSPHERES. PUMP SHOULD ONLY BE USED WITH LIQUIDS COMPATIBLE WITH PUMP COMPONENT MATERIALS. FAILURE TO FOLLOW THIS WARNING CAN RESULT IN PERSONAL INJURY AND/OR PROPERTY DAMAGE.

2. Make certain that the power source conforms to the requirements of your equipment.
3. Provide adequate protection and guarding around moving parts.
4. Disconnect power before servicing. If the power disconnect is out of sight, lock in the open position and tag it to prevent unexpected application of power. Failure to do so could result in fatal electrical shock!
5. Release all pressure within the system before servicing any component.
6. Drain all liquids from the system or isolate pump with service valve on either side, before servicing.
7. Secure the discharge line before starting the pump. An unsecured discharge line will whip, possibly causing personal injury and/or property damage.
8. Check hoses for weak or worn condition before each use, making certain that all connections are secure.
9. Periodically inspect pump and system components. Perform routine maintenance as required (see Maintenance section).
10. Provide a means of pressure relief for pump wherein discharge line can be shut off or obstructed.
11. Personal Safety:
 - a. Wear safety glasses at all times when working with pumps.
 - b. Keep work area clean, uncluttered and properly lighted — replace all unused tools and equipment.
 - c. Keep visitors at a safe distance from the work area.
 - d. Make workshop child proof — with padlocks, master switches, and by removing starter keys.
12. When wiring an electrically driven pump, follow all electrical and safety codes, as well as the most recent National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA).
13. For proper grounding, do the following:
 - a. Single-Phase

WARNING: RISK OF ELECTRIC SHOCK!

Models 1P899A thru 1P903A, 2P432 thru 2P434, 2P609 and 2P610 are for use with 115V (single phase) only. Models 2P612, 2P435 and 2P436 can be used with 115V or 208-230V (single phase). All models are intended to be permanently installed using a power supply with a ground.

To reduce risk of electrical shock, the motor must be securely and adequately grounded! This can be accomplished by either:

1. Permanently wiring the unit with a grounded metal raceway system.
2. Using a separate ground wire connected to the bare metal of the motor frame.
3. Other suitable means.

The motor must be securely and adequately grounded for your protection against shock hazards!

b. Three-Phase

WARNING: RISK OF ELECTRIC SHOCK!

To reduce risk of electric shock, the motor used with Models 2P611, 3P701 and 3P702 must be securely and adequately grounded to a grounded metal raceway system, or by using a separate grounding wire connected to bare metal on the motor frame, or to the grounding screw located inside motor terminal box, or other suitable means. Refer to National Electric Code (NEC) Article 250 (Grounding) for additional information.

c. All Models

To ensure a proper ground, the grounding means must be tested by a qualified electrician.

14. All wiring should be performed by a qualified electrician.
15. Keep fingers and foreign objects away from ventilation and other openings. Do not insert any objects into the motor.
16. Use wire of adequate size to minimize voltage drop at the motor.
17. Do not touch an operating motor. Modern motors are designed to operate at high temperatures.
18. For systems providing water for human consumption, use bronze body pumps.
19. It is strongly recommended that this unit be wired into a Ground Fault Circuit Interrupter (GFCI). Consult a local electrician for installation and availability.

WARNING: DO NOT HANDLE A PUMP OR PUMP MOTOR WITH WET HANDS OR WHEN STANDING ON A WET OR DAMP SURFACE, OR IN WATER.

Installation

WARNING: IN ANY INSTALLATIONS WHERE PROPERTY DAMAGE AND/OR PERSONAL INJURY MIGHT RESULT FROM AN INOPERATIVE PUMP DUE TO POWER OUTAGES, LEAKING PUMP DISCHARGE LINE BLOCKAGE, OR ANY OTHER REASON, A BACKUP SYSTEM(S) SHOULD BE USED.

WARNING: SUPPORT PUMP AND PIPING WHEN ASSEMBLING AND WHEN INSTALLED. FAILURE TO DO SO MAY CAUSE PIPING TO BREAK, PUMP TO FAIL, MOTOR BEARING FAILURES, ETC., ALL OF WHICH CAN RESULT IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

1. This unit is not waterproof and is not intended to be used in showers, saunas, or other potentially wet locations. The motor is designed to be used in a clean dry location with access to an adequate supply of cooling air. Ambient temperature around the motor should not exceed 104°F (40°C). For outdoor installations motor must be protected by a cover that does not block air flow to and around the motor. This unit is not weatherproof nor is it able to be submersed in water, or any other liquid.
2. Locate pump as close to the fluid source as possible, thus making the suction line as short and direct as possible. (Unit is not self-priming.)

NOTE: Teel circulators are generally installed in vertical pipelines and are shipped for down discharge except Models 2P434, 2P435, 2P436, 2P610 thru 2P612, 3P701 and 3P702 which are shipped for up discharge. This may be changed easily for horizontal pipelines or for opposite flow directions. To make the change, remove the body capscrews, taking care body gasket is kept in position; rotate body so that arrow on body points in the desired direction of flow.

Insert body capscrews and tighten evenly. Turn pump shaft by rotating coupler inside the bracket by hand to make sure shaft turns freely and impeller does not rub in body. Always install with motor shaft in a horizontal position with pump oil cup on top.

3. The pump should be installed in a position to permit proper lubrication and servicing. Motor and bearing bracket are to be kept free of insulation. A height of approximately four feet above floor is recommended. When installing pump in piping, place pipe flanges on pipe and then place rubber gaskets between pipe flanges and pump body. Then tighten flange bolts evenly, but do not tighten excessively.
4. Gate valves (not furnished) should be installed on discharge and suction side of pump to facilitate service.
5. Support the piping independently of the pump to avoid excessive stresses on the pump casing which would cause impeller misalignment and possible pump failure.
6. Install both a union and a gate valve (not furnished) on the discharge side of the pump for service convenience.

CAUTION: Do not use a globe or other restricting type of valve at the discharge. Globe valves seriously restrict the capacity of the pump.

7. Wiring: Refer to Figures 2a, b and c.
 - a. Follow all local electrical and safety codes, as well as the National Electrical Code and the Occupational Safety and Health Act.
 - b. Motor must be securely and adequately grounded. This can be accomplished by wiring with a grounded, metal-clad raceway system, by using a separate ground wire connected to the bare metal of the motor frame, or other suitable means.
 - c. Connections should be made with flexible conduit to minimize vibration transmission.

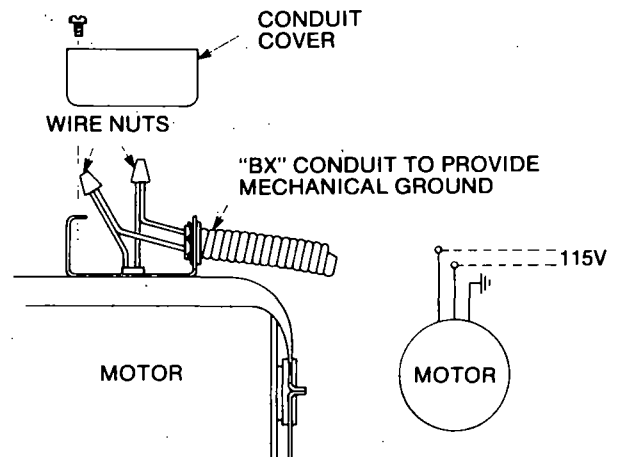


Figure 2a — Wiring Diagram for Models 1P899A thru 1P903A, 2P432, 2P433, 2P434, 2P609 & 2P610

WARNING: ALL MOTORS ARE DESIGNED FOR 60 Hz, 1 PHASE, 115 VOLT POWER ONLY EXCEPT MODELS 2P435, 2P436 AND 2P612 WHICH CAN OPERATE ON 115 OR 208/230V.

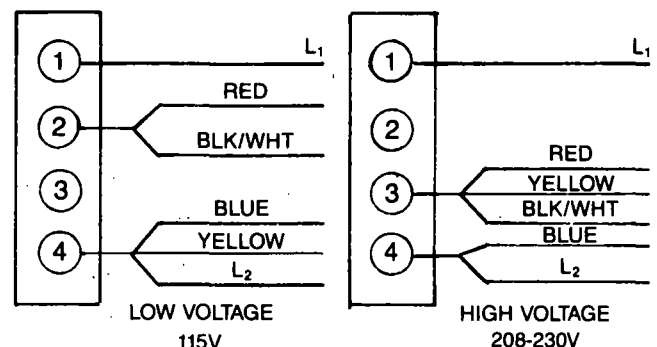


Figure 2b — Wiring Diagrams for Models 2P435, 2P436 & 2P612

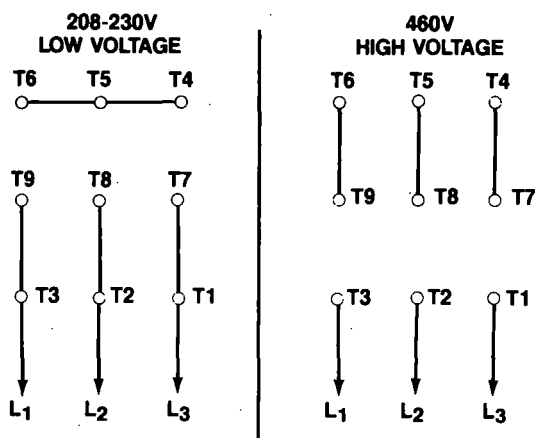
Installation (Continued)

Figure 2c — Wiring Diagrams for Models 2P611, 3P701 & 3P702

- d. For proper electrical connections, refer to the connection diagram located on the nameplate or inside the terminal box of the motor.
- e. Whenever possible, the pump should be powered from a separate branch circuit of adequate capacity to keep voltage drop to a minimum during starting and running.
- f. If the motor wiring must be changed to conform to your specific voltage requirements then the motor should be rewired to conform to one of the preceding diagrams (either 115V or 230V, single phase; 230V or 460V, three phase; depending on the model).
- g. If the above information or the following diagrams are confusing, then an electrician familiar with motor wiring should be consulted.

WARNING: AN INCORRECT CONNECTION MAY CAUSE AN ELECTRIC SHORT, PRODUCE AN ELECTRICAL SHOCK OR BURN OUT THE PUMP MOTOR, RESULTING IN PROPERTY DAMAGE AND/OR PERSONAL INJURY.

8. Check impeller for proper rotation. Single phase motors on these pumps are one rotation only and cannot be reversed. To change pumping direction, pump casting may be turned around (see Installation, Step 2). When viewing the rear of motor (opposite the pump end), the motor shaft should rotate counterclockwise, except Models 2P434, 2P435, 2P436, 2P610 thru 2P612, 3P701 and 3P702 which rotate clockwise. Three phase motor rotation must match the correct impeller rotation. To change direction, reverse any two hot leads.

WARNING: DISCONNECT POWER SUPPLY BEFORE ATTEMPTING TO CHANGE THE WIRING.

IMPORTANT: PROPER IMPELLER ROTATION DIRECTION IS CRITICAL FOR CENTRIFUGAL PUMPS.

9. All single-phase motors have built-in thermal protection, for all voltages.

Three-phase motors do not have built-in thermal protection. It is recommended that a properly sized magnetic or manual starter (both with properly sized heaters) be used with all three-phase motors. Install starters following instructions of the starter manufacturer.

All motors (single and three phase) should be equipped with a correctly fused disconnect switch to provide protection. Consult local or national electric codes for proper fuse protection based on motor data given in Specifications.

10. Install auxiliary components (e.g. pressure switch, timer, etc.).

Preparation For Operation

Before starting the pump, the system must be thoroughly cleaned, flushed and drained and then replenished with clean liquid. Welding slag, foreign materials, and cleaning compounds are detrimental to the pump internals. Warranty will be void if any of the above conditions are allowed to exist.

CHECKLIST

- ✓Is the pump primed?
- ✓Is rotation correct?
- ✓Is the pump properly lubricated?
- ✓Does power supply agree with data on motor nameplate?
- ✓Is power supply protection provided?
- ✓Is the system clean?

Operation

1. Before operation, lubricate pump bearing (located on impeller assembly, Figure 5, Ref. No. 8) with oil tube provided. Slowly add oil (approximately 1/2 ounce on all models except 2P436, 3P612, 3P701 and 3P702. To these add 3/4 ounces, see Maintenance). Stop if cup fills before specified amount is added (see Figure 4).
2. The pump must be fully primed on start-up. Fill system piping and pump body with liquid and vent entire system by turning pump by hand to dislodge air from body. Make sure fittings and drain valve are air tight.

CAUTION: Do not run pump dry as permanent damage to the mechanical seal will result. Lubricate pump prior to operating.

3. Activate the unit.

IMPORTANT: POWER SHOULD BE APPLIED MOMENTARILY TO THE PUMP AT FIRST AND THE DIRECTION OF ROTATION CHECKED. WHEN VIEWING THE REAR OF THE MOTOR (OPPOSITE END PUMP), THE MOTOR SHAFT ON ALL MODELS EXCEPT 2P434, 2P435, 2P436, 2P610 THRU 2P612, 3P701 AND 3P702 SHOULD BE ROTATING COUNTERCLOCKWISE. IF IT IS NOT, DISCONNECT POWER AND RECHECK WIRING TO MOTOR. (SEE STEPS 7 AND 8 UNDER INSTALLATION.)

NOTE: Never shut off discharge or restrict suction flow while the pump is operating.

Maintenance

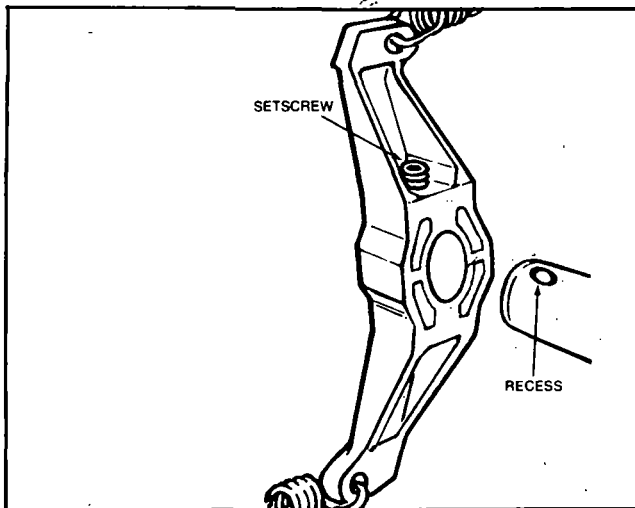


Figure 3 — Shaft Mounting

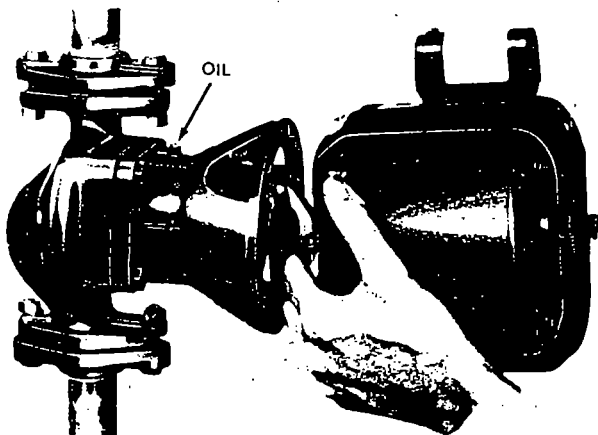


Figure 4 — Coupler Replacement & Lubricating

ROUTINE

Pump should be checked daily, weekly, monthly, etc. for proper operation. If anything has changed since unit was new, unit should be removed and repaired or replaced. Only qualified electricians or servicemen should attempt to repair this unit. Improper repair and/or assembly can cause an electrical shock hazard.

WARNING: MAKE CERTAIN THAT THE POWER SOURCE IS DISCONNECTED BEFORE ATTEMPTING TO SERVICE OR DISASSEMBLE ANY COMPONENTS! IF THE POWER DISCONNECT IS OUT-OF-SIGHT, LOCK IT IN THE OPEN POSITION AND TAG TO PREVENT APPLICATION OF POWER.

LUBRICATION

A start of each heating season and/or every 6 months, lubricate oil cup located on impeller assembly (Figure 5, Ref. No. 8) with nondetergent (regular) SAE-30 motor oil as described below:

1. Stop motor while adding oil.
2. For all models except 2P436, 2P612, 3P701 & 3P702 slowly add 1/4 ounce (30 drops) to oil cup located on

impeller assembly (Figure 5, Ref. No. 8). Stop if cup fills before specified amount is added (see Figure 4).

For Models 2P436, 2P612, 3P701 & 3P702 slowly add 3/4 ounces to oil cup. Be sure oil is visible at top or center of window on side of bracket and maintain this level at all times.

3. Motor bearings on all models except 2P435, 2P436 and 2P612 are permanently lubricated and need no lubrication for the life of the unit.

On Models 2P435, 2P436 and 2P612 motor sleeve bearings should, after three (3) years of normal service, be reoiled annually with ten (10) drops 5W30 or 10W oil. Do not over oil (Refer to motor nameplate.)

CAUTION: Do not overoil or spill oil on resilient motor rings.

MOTOR REPLACEMENT

Refer to Figures 3 & 4

1. Shut off electric power supply to pump. Disconnect power supply at motor. With motor still in place, rotate coupler by hand for access to setscrew.
2. Loosen setscrews holding coupler to shaft of motor so that setscrew clears recess in shaft.
3. Remove motor assembly by removing four capscrews.
4. Connect coupler to shaft of new motor by placing thumb of one hand behind coupler-half to be attached and sliding it onto shaft. (If shaft has a dimple, use care to line up setscrew with recess in shaft.) Securely tighten setscrew in recess and attach motor assembly to bearing assembly with four capscrews.
5. Reconnect electric power supply and test for proper operation.

IMPELLER ASSEMBLY KIT

NOTE: Replace the seal, bearing, coupling, impeller and shaft only with a Teel impeller assembly kit.

1. Shut off electric power supply to pump. Drain system (or close gate valve if available).
2. Loosen setscrew holding four spring or flexible coupler to shaft of motor. Loosen enough so that setscrew clears recess in shaft.
3. Remove motor assembly by removing four capscrews.
4. Remove bearing/impeller assembly from pump body, with coupler and impeller attached, by removing body capscrews. See Figure 5 or 6.
5. Remove and discard old gasket.
6. With new gasket in place, fit bearing assembly kit into pump body and tighten body capscrews.

IMPORTANT: GAP BETWEEN BEARING ASSEMBLY AND PUMP BODY IS NORMAL ON ALL SIZES EXCEPT MODELS 2P436, 2P612, 3P701 & 3P702 WHEN USING A TEEL BEARING ASSEMBLY KIT WITH ANY CIRCULATOR. DO NOT OVERTIGHTEN BODY CAPSCREWS.

Maintenance (Continued)

7. Whenever installing or reinstalling a 3-piece flexible coupler the following steps must be taken to insure proper pump operation. Motor must be removed to replace coupler.

Coupler Replacement, Models 1P899A thru 1P903A, 2P432, 2P433, 2P609

Connect coupler to shaft of motor by placing index finger of one hand behind loose coupler-half to be attached and sliding it onto shaft, using care to line up setscrew with recess in shaft. Securely tighten set-screw in recess and attach motor assembly to bearing assembly with four capscrews (Figs. 3 and 4).

Coupler Replacement, Models 2P436, 2P612, 3P701, 3P702

- Place one coupler flange on the shaft of the pump bracket. Tap the coupler flange down (with a rubber or wooden mallet) until the face of the inside hub on the coupler flange is flush with the face of the shaft. Tighten the two setscrews until snug. Do not overtighten.
- Insert rubber sleeve into above coupler flange.
- Place remaining coupler flange on the motor shaft. Initially this flange must be installed so that the motor shaft extends approximately 3/4" from the face of the coupler.
- Bolt motor assembly to pump bracket assembly.
- Remove the sheet metal coupler guard from the pump bracket. Place two screwdrivers through

each opening in the bracket. Using the motor for leverage, push the motor end flange towards the pump end flange until fully engaged with the rubber sleeve.

- Once fully engaged, back motor end coupler flange off the sleeve approximately 1/32" and tighten setscrews until snug. Do not overtighten.

Coupler Replacement, Models 2P435, 2P434, 2P610, 2P611

- Place the coupler flange on the pump bracket shaft. Tap the coupler flange down (with a rubber or wooden mallet) until the keyway setscrew is aligned with the dimple on the shaft. Tighten set-screw in keyway until snug. Tighten second set-screw until snug. Do not overtighten.
 - Follow steps of Model 2P436 replacement, with this exception: disregard the portion of the instructions dealing with the coupler guard. Pumps using Model 2P435 coupler do not require a coupler guard.
- Add complete contents of oil bottle supplied to the oil cup on bearing/impeller assembly. See Figure 4.
 - Pump must be fully primed before start-up. Fill system piping and pump body and vent entire system by turning pump by hand to dislodge air from body.
 - Reconnect electric power supply and test for proper operation.

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. Water circulating pumps, Models 1P899A thru 1P903A, 2P432 thru 2P436, 2P609 thru 2P612, 3P701 & 3P702, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined by Dayton to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specified legal rights which vary from state to state.

LIMITATION OF LIABILITY. To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.

WARRANTY DISCLAIMER. Dayton has made a diligent effort to illustrate and describe the products in this literature accurately; however, such illustrations and descriptions are for the sole purpose of identification, and do not express or imply a warranty that the products are merchantable, or fit for a particular purpose, or that the products will necessarily conform to the illustrations or descriptions.

Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.

PRODUCT SUITABILITY. Many states and localities have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, please review the product application, and national and local codes and regulations, and be sure that the product, installation, and use will comply with them.

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some states do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of the Limited Warranty, any implied warranties of merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Chicago, IL 60648

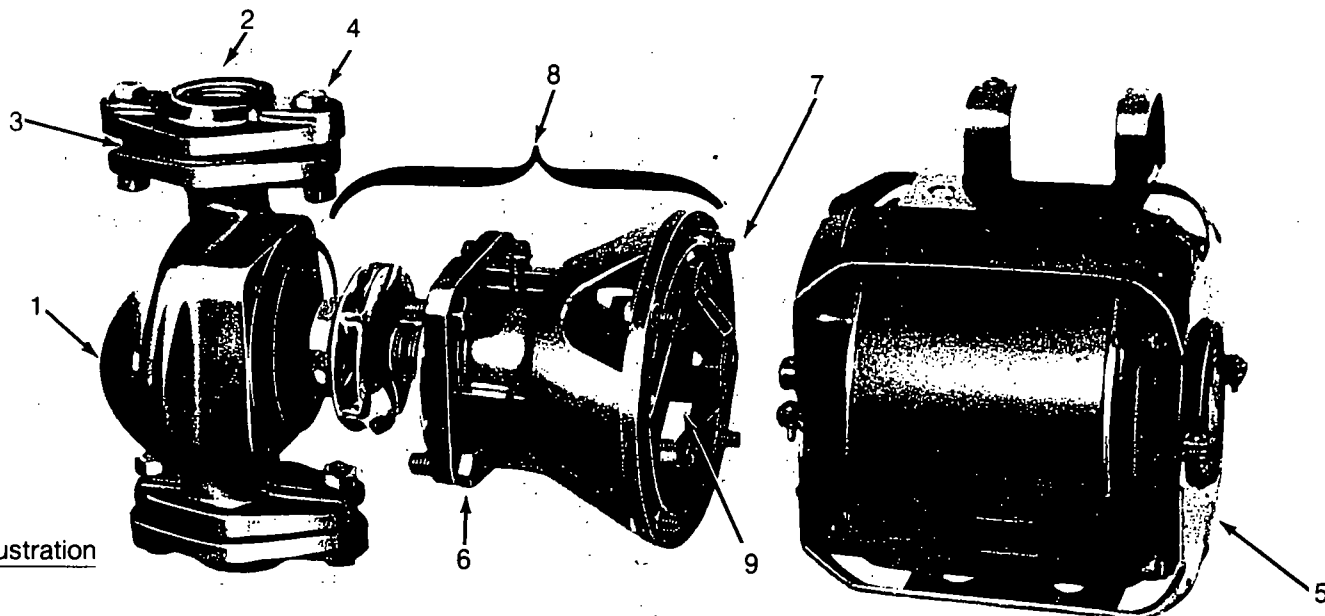


Figure 5 — Replacement Parts Illustration

Replacement Parts List

REF. NO.	DESCRIPTION	PART NUMBER FOR MODEL:							
		1P899A	1P900A	1P901A	1P902A	1P903A	2P432	2P433	2P609
1	Pump body	805482-011	816402-011	816327-011	811240-011	805482-041	816402-041	805484-011	811240-041
2	Flange	6X484 (3/4")	6X492 (1")	805210-011	6X485 (1")	6X488 (3/4")	2A639 (1")	—	—
		6X485 (1")	6X493 (1 1/4")	—	—	6X489 (1")	2A640 (1 1/4")	805189-011	6X489
		6X486 (1 1/4")	6X494 (1 1/2")	—	—	6X490 (1 1/4")	2A641 (1 1/2")	—	—
		6X487 (1 1/2")	—	—	—	6X491 (1 1/2")	—	—	—
3	Flange gasket (rubber)	816653-000	804034-000	805209-001	805176-000	816653-000	804034-000	805201-000	805176-000
4	Flange bolt & nut	7/16-14 x 1 3/4"	*	—	*	*	*	—	*
		1 1/2-13 x 2 1/4"	—	*	—	—	—	*	—
5	Mounted motor assembly	6K509	817025-001	817025-001	817025-001	6K509	817025-001	817025-007	817025-001
6	Pump body capscrew	3/8-18 x 7/8"	*	—	—	*	—	—	—
		7/16-14 x 1"	—	*	*	*	*	*	*
7	Motor capscrew	1/4-20 x 5/8"	*	—	—	*	—	—	—
8	Impeller assembly (pump repair kit)	5/16-18 x 3/4"	—	*	*	—	*	*	*
		1R241	1R247	1R247	1R248	1R249	1R470	1R471	1R472
9	Coupler assembly	1R271	1R271	1R271	1R271	1R271	1R271	1R463	1R462
△	Seal kit	816706-002	816706-002	816706-002	816706-002	816706-001	816706-001	816706-002	816706-001
△	Pump body gasket	104442-000	106049-000	106049-000	106050-000	104442-000	106049-000	106050-000	806050-000

* Standard hardware item, available locally.

† Kit comes assembled and includes impeller, seal, shaft & bearing module, bracket, gasket, coupler & tube of oil

△ Not illustrated.

NOTE: Motor bracket not available separately; part of motor.

ORDER REPLACEMENT PARTS BY CALLING TOLL FREE

1-800-323-0620 (Outside Illinois)
1-800-225-7149 (Inside Illinois)

Please provide the following information:

- Model Number
- Serial Number (if any)
- Parts Description and Number as shown in Parts List

Address parts correspondence to:

Dayton Electric Mfg. Co.
1250 Busch Parkway
Buffalo Grove, IL 60015

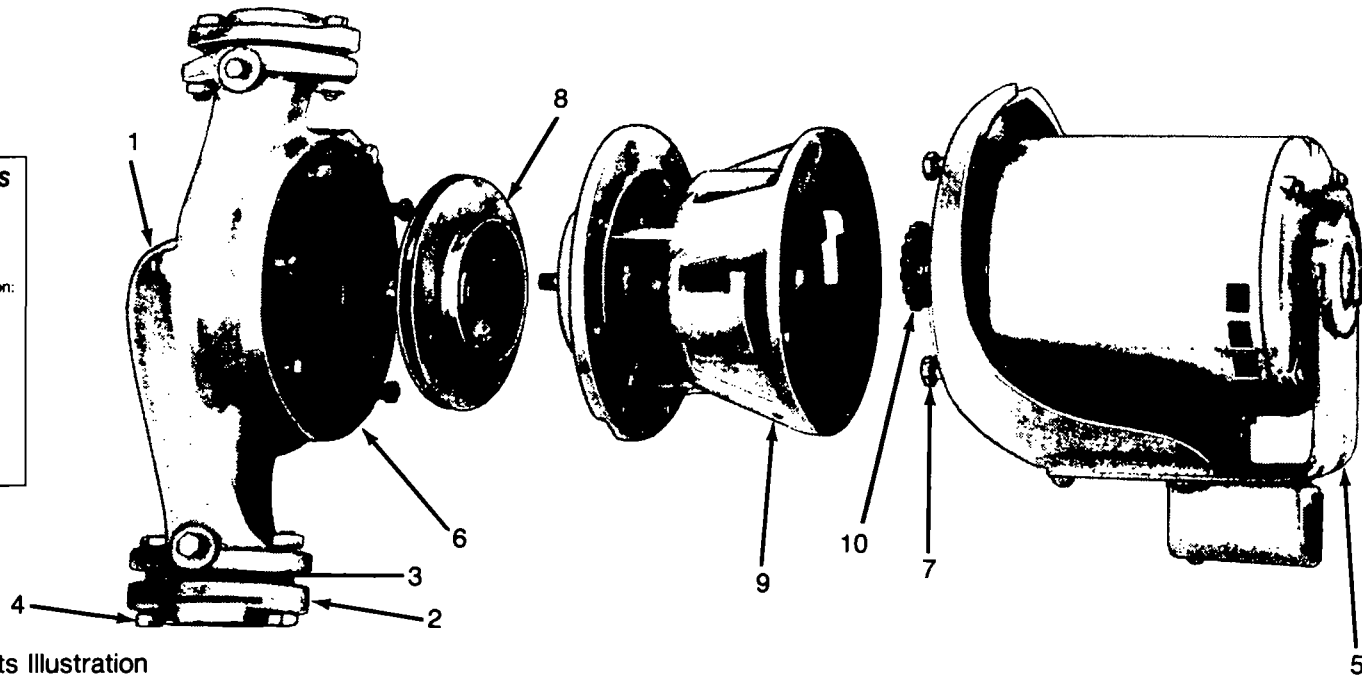


Figure 6 — Replacement Parts Illustration

Replacement Parts List

REF. NO.	DESCRIPTION	PART NUMBER FOR MODEL:							
		2P434	2P435	2P436	2P610	2P611	2P612	3P701	3P702
1	Pump body	816337-011	816337-011	816397-011	816337-011	816338-011	816397-011	816397-011	816174-011
2	Flange	816012-011	815009-011	804301-011	816011-011	806074-011	804301-011	804301-011	806074-011
3	Flange gasket (rubber)	805176-001	805176-001	804034-000	805176-001	816117-000	804034-000	804034-000	816117-000
4	Flange bolt & nut	*	*	*	*	—	*	*	—
5	Mounted motor assembly	816141-001	811757-001	811757-002	816141-002	831012-083	811757-001	816676-069	816678-069
6	Pump body capscrew	—	—	*	—	—	*	*	*
7	Motor capscrew	*	*	*	*	*	*	*	*
8	Impeller	816302-049	816303-047	874058-045	816302-047	816304-047	874058-051	874058-041	816393-043
9	†Bearing assembly	1R467	1R467	1R469	1R467	1R467	1R469	1R469	1R469
10	△ Coupler assembly	1R464	1R465	1R466	1R464	1R465	1R466	1R466	1R466
△	Seal kit	816706-001	816706-001	816707-001	816706-001	816706-001	816707-001	816707-001	816707-001
△	Pump body gasket	806158-000	806158-000	106592-000	106158-000	106158-000	106592-000	106592-000	106592-000

*Standard hardware item, available locally.

△Not illustrated.

†Bearing assembly includes seal, shaft and bearings, gasket and tube of oil.

NOTE: Motor bracket not available separately; part of motor.

Troubleshooting Chart

SYMPTOMS	POSSIBLE CAUSE(S)	CORRECTIVE ACTION
No liquid delivered.	<ol style="list-style-type: none"> 1. Pump not primed. 2. Speed too low. 3. Air leak in suction. 4. Discharge head too high. 5. Suction lift too high. 6. Impeller plugged. 7. Wrong direction of rotation. 8. Coupler broken because of pump and motor shaft misalignment. 9. Coupler broken because of pump bearing being worn and assembly wobbling. 	<ol style="list-style-type: none"> 1. Prime pump. 2. Check voltage. 3. Repair or replace. 4. Lower the height. 5. Lower the height. 6. Clean out. 7. Change direction. 8. Motor rubber resilient rings sagged, replace motor. 9. Replace impeller assembly.
Not enough liquid delivered.	<ol style="list-style-type: none"> 1. Air leaks in suction. 2. Speed too low. 3. Discharge head too high. 4. Suction lift too high. 5. Impeller partially plugged. 6. Not enough suction head for hot liquid. 7. Impeller or casing damaged. 8. Suction not submerged enough. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Check voltage. 3. Lower the height. 4. Lower the height. 5. Clean out. 6. Increase suction head. 7. Replace. 8. Submerge suction.
Not enough pressure.	<ol style="list-style-type: none"> 1. Speed too low. 2. Air or gas in liquid or leaks in suction. 3. Impeller damaged or partially plugged. 4. Pumped liquid has too much solid material mixed with it. 	<ol style="list-style-type: none"> 1. Check voltage. 2. Repair or replace suction line. 3. Clean or replace. 4. Add strainer.
Pump works for awhile then loses suction.	<ol style="list-style-type: none"> 1. Leaky suction line. 2. Suction lift too high. 3. End of suction line uncovered. 4. Air leaks in suction. 	<ol style="list-style-type: none"> 1. Repair or replace. 2. Lower the height. 3. Submerge end of suction line. 4. Repair or replace suction line.
Motor trips overload.	<ol style="list-style-type: none"> 1. Seal binding. 2. Rotor binding. 3. Voltage and frequency lower than rating. 4. Defects in motor. 	<ol style="list-style-type: none"> 1. Replace. 2. Repair or replace. 3. Reconnect to rated voltage and frequency. 4. Repair or replace.
Seal leaks.	<ol style="list-style-type: none"> 1. Corrosion due to character of liquid pumped. 2. Excessive amounts of abrasive material in liquid causing an accumulation around the rotation assembly. 	<ol style="list-style-type: none"> 1. Check compatibility of seal for liquid being pumped. 2. Remove abrasive material prior to pumping.

Service Record

DATE	MAINTENANCE PERFORMED	REPLACEMENT COMPONENTS REQUIRED

Notes

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