

## TROUBLE GUIDE

THE FOLLOWING ARE SOME COMMON CAUSES OF PROBLEMS THAT MAY ARISE:

### PROBLEMS

### POSSIBLE CAUSES & SOLUTIONS

- A. PUMP WILL NOT PRIME:**
1. Make sure pool water is midway of skimmer opening.
  2. Make sure strainer basket is not clogged.
  3. Make sure strainer basket is positioned properly!
  4. Tighten lid down snugly.
  5. Make sure strainer pot is full of water.
  6. Tighten all fittings and seal all joints on suction side.
  7. Clean skimmer and pump strainer baskets.
  8. Remove pump lid and check for clogging.
  9. Open all valves in return and suction lines.
  10. Remove and replace pump seal if needed.
  11. Check voltage at pump to be sure it is same as motor specs.
- B. LOW FLOW**
1. If filter gauge reads high.
    - a. Filter is dirty.
    - b. Clogged return lines.
  2. If filter pressure gauge reads low.
    - a. Pump or skimmer strainer basket is clogged.
    - b. Skimmer or main drain valve is closed.
    - c. Air leak in suction line.
    - d. Impeller setting is incorrect.
    - e. Debris on impeller vanes.
- C. MOTOR RUNS HOT**
1. Motors will run hot to the touch, however, they are designed this way. Thermal overload protector will function to turn the motor off if there is an overload problem.
  2. Factors which will increase operating temperature:
    - a. Installed in direct sun.
    - b. Poor ventilation.
    - c. Low voltage.
    - d. Wiring is incorrect size for load.
- D. MOTOR WILL NOT TURN**
1. Check that all power switches are on, fuse not blown, and circuit breaker is not tripped.
  2. Timer improperly set.
  3. Impeller is against volute face.

SAVE THESE INSTRUCTIONS.



PENTAIR POOL PRODUCTS, INC. pumps are warranted to be free from defects in material and workmanship. Should any of the operating parts become defective within one year from date of purchase, they will be replaced or repaired if defect is proved to be the responsibility of PENTAIR POOL PRODUCTS, INC.

All adjustments are to be based on list prices in effect at the time of adjustment. PENTAIR POOL PRODUCTS, INC. will not be liable for the cost of labor or removing or replacing parts. Purchase agrees to prepay all shipping charges to and from PENTAIR POOL PRODUCTS, INC.: 1620 Hawkins Ave., Sanford, NC 27330 or 10951 West Los Angeles Ave., Moorpark, CA 93021, whichever is closer or more convenient.

This warranty does not cover failure in service due to fire, wrecks, freezing, willful abuse, improper repackaging or damage incurred in shipping nor does it extend to consequential damages.



**Pentair**  
*Pool Products™*

*Because reliability matters most*

# HYDRO PUMP® AND ENERGY MASTER™ HYDRO PUMP®

TWO SPEED POOL AND SPA PUMP



# INSTRUCTIONS

## READ AND FOLLOW ALL INSTRUCTIONS

### GENERAL:

Our shipping container has been specifically designed to prevent transit damage. However, any indications of damage should be carefully noted on the delivery ticket and a claim filed promptly with the carrier.

### LOCATION:

Locate the pump as close as possible to the pool. Provide the necessary space around the pump for future inspection and servicing of the unit. If possible, allow several inches of clearance below the motor to floor to allow easy access to mounting screw. Locate away from pool chemicals to prevent spilling on or near motor.

### INSTALLATION:

The pump suction line should not be smaller than the pipe size on the inlet of the pump.

Your pump is made of the finest engineering materials available today. A few simple precautions taken during the initial installation, will insure many long years of trouble-free operation.

The threads of pipe fittings screwed into pump must be sealed with: pipe sealant, Teflon® Tape, R.T.V. or other sealing materials approved for pipe threads.

Tighten the pump fitting only as much as is required to insure a tight connection. **DO NOT OVERTIGHTEN.**

The piping should be supported independently and not supported by the pump.

The pump motor must be wired for the proper voltage, and rotation, in accordance with the wiring diagram supplied with the motor. All wiring should be done by a licensed electrician in accordance with local codes, be certain that the motor frame is grounded. Use lug on top of motor frame to bond together motor and all metallic parts of pool, spa or hot tub structure and to all electrical equipment, metal conduit, and metal piping within 5 feet of the inside walls of a swimming pool, spa or hot tub, when the motor is installed within 5 feet of the inside walls of the swimming pool, spa or hot tub structure with a solid copper conductor not less than No. 8 A.W.G.

Motor name plate has voltage, phase, amperage draw and other motor information. Terminal cover plate or name plate has wiring connection information.

The wiring to motor should be kept as short as possible and large enough to carry the necessary current for required length without excessive voltage drop. The following table should be followed to be sure that the proper wire size is selected. Use as a guide only.

TABLE OF A.W.G. WIRE SIZE FOR SINGLE-PHASE POOL PUMP MOTORS

H.P.	WIRE LENGTH	
	50 FEET VOLTS	100 FEET VOLTS
1/3	14	14
1/2	14	12
3/4	12	12
1	12	10
1 1/2	10	10
2	10	8
3	-	-

**WARNING:** - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

### PRIMING:

Fill the pump pot with water before starting the pump. This may be done by removing clear lid. Pumps are self priming providing the pump pot is filled with water. Should you lose this liquid from the pot accidentally or by draining purposefully, it will be necessary to refill it with liquid before starting. High Suction Lifts, require additional time for priming.

### OPERATION:

After the pump has been filled with water, and the motor started, allow a few moments for the pump to start pumping water. If flow does not start within four minutes, stop motor and refer to (THE TROUBLE GUIDE). Be sure all suction and discharge valves are open when the pump is running. Operating the pump with a closed valve in the system can cause pump damage.

### WINTERIZING:

In areas subject to freezing winter temperatures, protect pump by removing both drain plugs, one from the pump volute and one from the pot. Do Not Replace Plugs, store them in strainer basket for the winter.

An alternate is to remove the pump and motor from plumbing and store them indoors in a warm, dry location.

### MAINTENANCE:

The strainer basket in pump should be inspected and cleaned twice each week. The strainer basket is easy to clean. Loosen the knobs and remove the clear lid. Remove the basket and clean. Inspect the Lid "O"-Ring; if damaged, replace. Install the Clear Lid, tightening knobs by hand only. The pump seal requires no lubrication. Refer to motor service center for motors.

# HOW TO ORDER PARTS

WHEN ORDERING PARTS, GIVE

H.P., PUMP SERIAL NO., MODEL NO. & ITEM NO.  
TO YOUR LOCAL DEALER

H.P., PUMP SERIAL NO. & MODEL NO.  
ARE LOCATED ON PUMP

22	1	35-3450	Motor Support (for 5 1/2 Dia. Motor)
21	1	15-4909	Motor Outrigger
20	2	35-4256	Set Screw 1/4" x 20 x 3/8" S.S.
19	4	35-4290	Cap Screw 3/8 - 16 x 1" S.S.
18	8	35-4265	Hex Washer Head Screw 5/16" - 18
17	1	35-4001	3/4 Mechanical Seal
16	1	35-2670	Basket w/Handle - Plastic 700
16	1	35-2656	Basket w/Handle - Plastic 590
15	1	35-2600	Lid O-Ring 700
15	1	35-2602	Lid O-Ring 590
14	1	35-3525	Clear Lid - 700 Plastic
14	1	35-3625	Clear Lid - 590 Plastic
13	2	35-4280	Knob - Pot Plastic
12	1	35-4127	Strainer Pot 700 (Plastic)
12	1	35-4125	Strainer Pot 590 (Plastic)
11	2	154699	Plug-Wing .25" Drain Lgr
10	1	19-2323	O-Ring (Pot to Volute)
9	1	35-3912	Volute - Plastic
8	1	35-2626	O-Ring Volute to Bracket
7	1	35-3220	Impeller RPE 3HP
7	1	35-3050	Impeller RPE 2HP 21/2HP
7	1	35-3049	Impeller RPE 1 1/2HP, RPA 2HP
7	1	35-3013	Impeller RPE 1HP, 1 1/2HP
7	1	35-3044	Impeller RPE 3/4HP, RPA 1HP
7	1	35-3043	Impeller RFP 1/2HP, RPA 3/4HP
7	1	35-3041	Impeller, RPA 1/2 HP
6	2	15-4445	Hex Nut 3/8 - 16 Cad. Pltd.
5	1	35-4894	Pump Tri Pod Base Plastic
4	1	35-3775	Seal Bracket - Plastic
3	2	35-4294	Screw, Cap 3/8 - 16 x 1 1/4" Cad. Pltd.
2	1	35-3750	Shaft Extension - Bronze
1			Motor

LIST OF MATERIAL OR PARTS LIST

## SPECIAL INSTRUCTION FOR TWO SPEED ENERGY MASTER HYDROPUMP:

The performance of this pump will be the same at high speed as the same model single speed pump, both hydraulically and prime wise. At low speed the pump will produce one half the flow and the pressure will drop GREATLY which is due to much lower system friction. These lower friction losses result in GREAT energy savings. On low speed the electrical energy savings are 60%.

Turn motor to high speed for vacuuming the pool, reading the pressure gauge to determine if cleaning or back washing of filter is required, for fast clean-up of pool water, and for priming the system to rid it of all air. Turn motor to low speed for quiet operation and electrical cost savings. Since the pump should be operated mostly at low speed for cost savings, minor adjustments may be required in the automatic chlorine dispenser, the skimmers and the heater due to the lower flow. (See the equipment manufacturers operation manuals).

All electrical work **MUST** be done by a licensed electrician. Before working on motors be certain that the electrical power is OFF at the main junction box. TWO SPEED pumps have SINGLE VOLTAGE motors which cannot be changed. See the motor nameplate for the motor being installed. ALL electrical connections should be made in the SIDE BOX which also includes a prewired HI-LO switch. See Diagram 1.

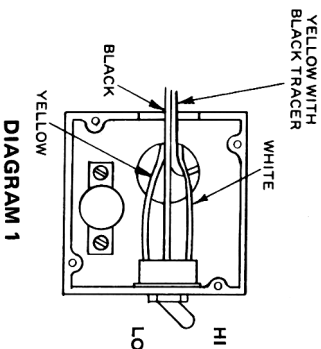


DIAGRAM 1

If an automatic timer is installed to change speeds, the wiring connected to the switch should be removed and the BLACK wire discarded. See Diagram 2. The timer should then be installed and connected to the motor as follows:

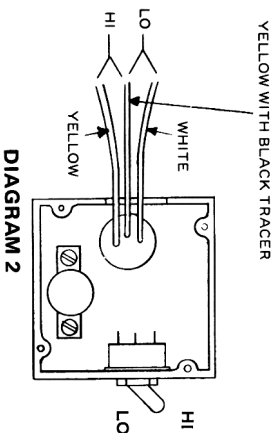


DIAGRAM 2

## TIMER INSTALLATION FOR HI-LO SWITCHING OF 2 SPEED HYDROPUMP®

An intermatic timer with single pole, double throw switch may be used to automatically switch the HYDROPUMP® between the high and low speed modes at present intervals.

- 1) Check to see that timer voltage is the same as that of the HYDROPUMP® motor. The following intermatic timers should be used.

Hydropump H.P.	Voltage	Timer Model
3/4	115	T175*
1, 1 1/2, 2	230	T176*

\*These models have skip-a-day wheel. Remove skip screws if not needed.

- 2) Connect the timer to the motor following Diagram 3.
3. All electrical connections to the motor should be made in the side box.

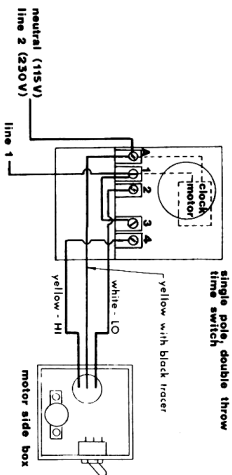


DIAGRAM 3

NOTE: When time switch is ON - pump is on HI. When time switch is OFF - pump is on LO.

CAUTION: Manual switch on motor side box must be disconnected when HYDROPUMP® is being controlled by the timer or the motor will be damaged.

## TIMER INSTALLATION FOR PROGRAMMED ON-OFF, HI-LO SWITCHING OF 2 SPEED HYDROPUMP®

Automatic on-off and hi speed-to speed control of the ENERGYMASTER 2 speed pump can be obtained by properly installing two appropriate timers. One timer must have a single-pole, double throw switch and the other must have a single-pole, single throw switch. Both timers and the HYDROPUMP® motor must be designed to operate on the same voltage.

Only intermatic timers are discussed below, but other types may be used if desired. The following timers are recommended for this installation:

Hydropump H.P.	Voltage	Intermatic Timer Model No.
3/4	115	S.P.D.T. S.P.S.T. T175* T101
1, 1 1/2, 2	230	T176* T102

\*These models have skip-a-day wheel. Remove skip screws if not needed.

- 1) Mount the timers side by side, between the power supply and the HYDROPUMP® an intermatic 2-in-1 raintight case is ideal for this installation.
- 2) Timer No. 1 will be used to control the hi speed-to speed switching of the motor.
- 3) Timer No. 2 will be used to automatically switch the HYDROPUMP® on and off.

The clocks of both timers must run continuously for the proper operation of the switching circuits. Therefore it is necessary to make a connection between line 1 and the clock input of timer No. 1. (See Diagram 4.)

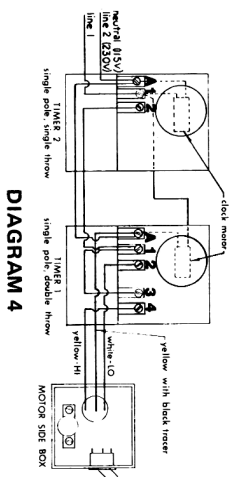


DIAGRAM 4

NOTE: When time switch 1 is ON - pump is on HI. When time switch 1 is OFF - pump is on LO.

All wiring connections should be made with 12 A.W.G. or larger wire size. All wiring connections to the HYDROPUMP® should be made inside the motor side box. The 2 speed motor is designed to operate on the voltage stamped on the nameplate only. Wiring with a different line voltage will damage the motor.

## OPERATING INSTRUCTIONS

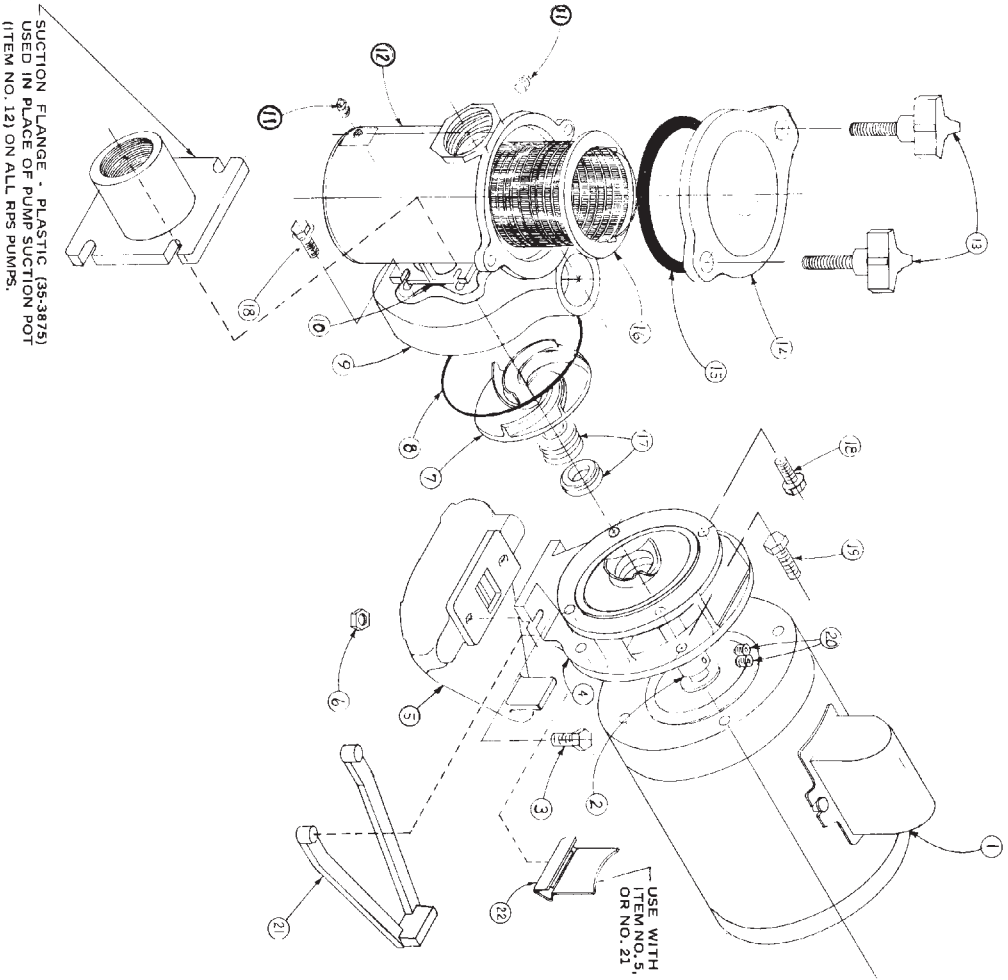
- 1) Set both clock dials to the exact time of day.
- 2) Locate the trippers on the clock dial of timer No. 2 to switch the HYDROPUMP® on and off at the desired times.
- 3) Locate the trippers on the clock dial of timer No. 1 to switch the HYDROPUMP® between hi and lo speed at the desired time. The timers should always be programmed so that the HYDROPUMP® will always operate for 10 minutes minimum at hi speed when it is switched on. This allows priming of the pump and evacuation of air from the piping system.
- 4) The pump may be manually switched between hi and lo speed by flipping the manual lever of timer No. 1, and may be switched on and off by flipping the manual lever of timer No. 2.

CAUTION: Always turn power off at main panel before servicing switches or pumps.

CAUTION: Be certain the wiring CANNOT allow both the HI and LO speed motor windings to be energized at the same time.

CAUTION: This pump is for use with permanently installed pools and may also be used with hot tubs and spas if so marked. Do not use with storage pools. A permanently installed pool is constructed in or on the ground or in a building such that it cannot be readily disassembled for storage. A storage pool is constructed so that it may be readily disassembled for storage and reassembled to its original integrity and has a maximum dimension of 18 feet and a maximum wall height of 42 inches.

Do not install within an outer enclosure or beneath the skirt of a hot tub or spa unless so marked.



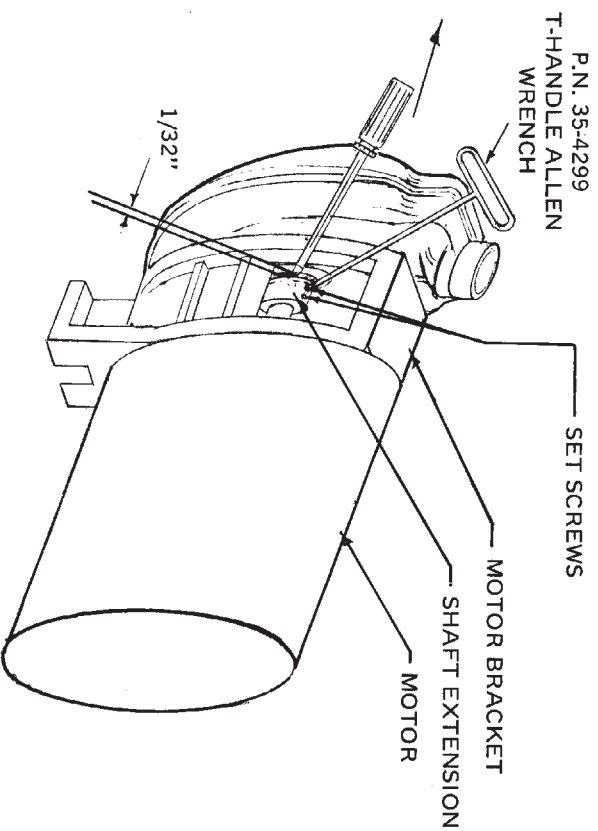
### IMPELLER CLEARANCE ADJUSTMENT

The Hydro-pump has an open face impeller which was precisely set at the factory. Under normal operating conditions it is not necessary to make further adjustment, however, if the pump draws excessive current a slight adjustment may be required.

Loose the shaft extension set screws and this will allow the mechanical seal spring to force the impeller face to touch the volute. Place a screwdriver between the motor bracket and the shaft extension as depicted below. Move the

screwdriver handle away from the motor, this will pull the impeller away from the volute. You should move the shaft extension about 1/32" and holding the screwdriver at this position firmly tighten the shaft extension set screws.

Start the pump and check the amperage draw. If the amperage exceeds the nameplate rating or if the pump performs poorly the adjustment needs to be redone.



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