

Installation, Operation, Repair and Parts Manual

Description

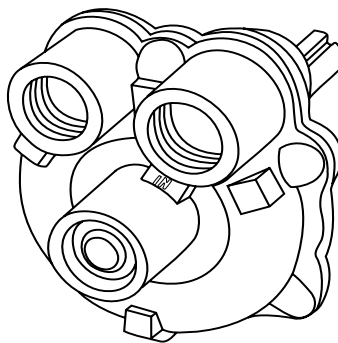
Hypro's 9600C Turbine pump is a high-capacity, low-pressure spray pump that is designed specifically for tractors with a 1000 rpm PTO.

The 9600C is built using a heavy-duty, cast iron body and glass-filled Valox impeller for wear resistance. The shaft is stainless steel and the lip seals are Viton® for corrosion protection.

The 9600C is a direct drive pump for high-volume spraying or liquid transfer applications. The pump features include large 1-1/2" ports, a 15/16" shaft with 1/4" keyway. Heavy-duty sealed bearings are used for longer life in agricultural spraying applications.

Forged steel couplers are available for mounting the 9600C turbine pump to a 1000 rpm tractor PTO shaft. Both the popular 1-3/8" and 1-3/4" PTO shaft couplers are available. These forged steel couplers lock the pump onto the PTO shaft for safe, long-lasting operation.

When using the 9600C, a 1-1/2" strainer with 50-mesh screen must be mounted on the inlet side of the pump to ensure longer pump life. Hypro has both heavy-duty nylon or economical polypropylene line strainers with stainless steel screens. Both types can handle the large capacity of the 9600C Turbine pump while protecting the pump from rocks and other debris. **Using pumps without strainers voids the warranty!**



SERIES 9600C

General Safety Information

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

1. Do not pump at pressures higher than the maximum recommended pressure.
2. Maximum liquid temperature is 140° F for Series 9600C Turbine pumps.
3. Disconnect power before servicing.
4. Drain all liquids from the system before servicing any component. Flush with water.
5. Check hose for weak or worn condition before each use. Make certain that all connections are tightly secured.
6. Periodically inspect the pump and the system components. Perform routine maintenance as required (see Maintenance section).
7. Use only pipe, hose and fittings rated for the maximum psi rating of the pump.
8. Do not use these pumps for pumping water or other liquids for human or animal consumption.

Plumbing Installation Instructions

Priming the Pump

IMPORTANT: PUMP MUST NOT BE RUN DRY.

Before starting the pump, the suction line and pump must be filled with liquid. **The pump must not be run unless it is filled with liquid because there is danger of damaging the impeller.**

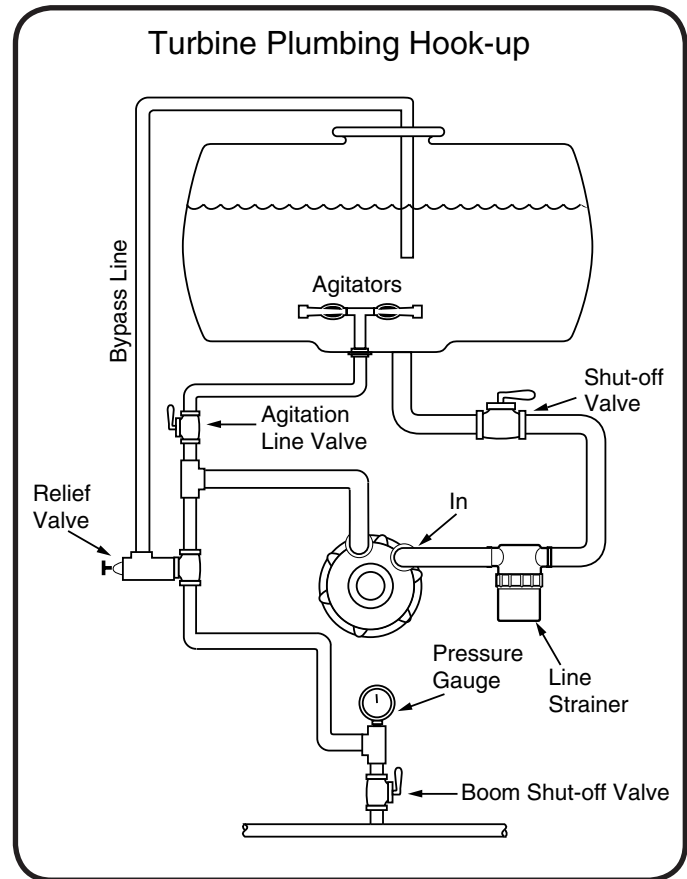
The turbine pump is not self-priming. If the pump cannot be mounted below level of liquid, mount the pump as near liquid source as practical so that a short pipe or hose may be used. The suction line should slope down to the pump. If not, install a foot valve in the suction line at the liquid source and prime by filling pump full before starting.

Selecting the Suction Line

To get the full capacity out of the pump, the suction line should be the same size as pump suction port. A smaller size can be used on the outlet for lower pump output, but the suction line must be at least the same size as the pump suction port. The suction line must be free of air leaks. Use a good grade of suction hose that will not collapse.

Strainer Selection

When using the 9600C turbine pump, a 1-1/2" strainer with 50-mesh screen must be mounted on the inlet side of the pump. To ensure longer pump life, Hypro has both nylon and polypropylene line strainers with 50-mesh stainless steel screens. Both types can handle the large capacity of the 9600C Turbine pump. **Using pumps without strainers voids the warranty!**



Tractor PTO Installation Instructions

Installation

1. Insert the forged steel coupler (Part No. 1320-0080 or 1320-0078) over the shaft of the 9600C turbine pump and secure in position by tightening down set screws provided.

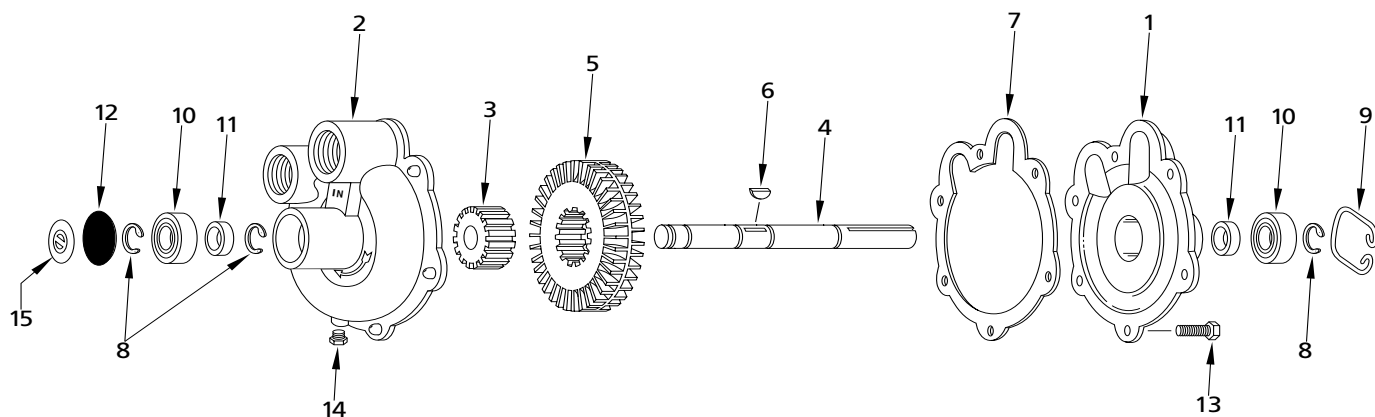
NOTE: Before mounting the pump, check to make sure that it moves freely when turning the drive shaft by hand (turn shaft counterclockwise). **DO NOT apply power to a pump that appears to be stuck.**

2. Install a Hypro torque arm and chain (Kit No. 3430-0346) or equivalent on the pump to keep it from rotating with the PTO. Proper installation of the torque arm is determined by where the torque arm chain is to be

secured to the tractor. If the chain is secured above the pump, then the torque arm should extend to the right of the pump when looking at the front or port side. If the chain is secured underneath the pump, then the torque arm should extend to the left when looking at the front.

3. Slip pump and adaptor onto PTO shaft and secure with set screws provided. Fasten torque arm and chain directly above or below, whichever applies, or as close to vertical as possible to avoid backward or forward pull on the pump.

Model 9600C



Seal and O-ring Repair Kit No. 3430-0347 consists of
(2) Ref. 11 seals (Viton) and
(1) Ref. 7 gasket.

Ref. No.	Qty. Req'd.	Part Number	Description
1	1	0150-9600C	Body
2	1	0250-9600C	Housing
3	1	1201-0015	Impeller Insert
4	1	0500-9600	Shaft, stainless steel, 15/16" diameter, 1/4" keyway
5	1	0400-9600P	Impeller, corrosion-resistant Valox®
6	1	1610-0045	Key - Woodruff

Ref. No.	Qty. Req'd.	Part Number	Description
7	1	1710-0015	Gasket
8	3	1810-0008	Retainer ring - external
9	1	1820-0025	Retainer ring - internal
10	2	2008-0001	Sealed ball bearing
11	2	2112-0003	Seal - Viton
12	1	2300-0020	Bearing cover
13	6	2210-0026	Screw, hex head
14	1	2406-0007	Pipe plug
15	1	6031-0299	Decal

Operation

Controlling the Flow

A flow control valve is used in the agitation line which allows the operator to control agitation flow and pressure independently of nozzle flow. A relief valve or other type of bypass valve must be installed in the discharge line between the pump outlet port and spray boom shut-off valve. Excessive volume not needed at the spray boom may be bypassed through this valve.

To Adjust For Spraying

1. Prime pump with all valves open.
2. Close the agitation line valve until sufficient agitation is observed.
3. With the pump running, turn the relief valve adjustment knob clockwise until the pressure gauge indicates the desired spraying pressure.
4. Make sure the flow is uniform from all nozzles.

After spraying adjustments are made, it is only necessary to close boom shut-off valve to discontinue spraying.

Flush Pump After Use

One of the most common causes for faulty pump performance is "gumming" or corrosion inside the pump. Flush the pump and entire system with a solution that will chemically neutralize the liquid pumped. Mix according to manufacturer's directions. This will dissolve most residue remaining in the pump, leaving the inside of the pump clean for the next use.

To Prevent Corrosion

After cleaning the pump as directed, flush with a permanent-type automobile antifreeze (Prestone, Zerex, etc.) containing a rust inhibitor. Use a 50% solution - that is, half antifreeze and half water, or fill pump with FLUID FILM, and then drain it. A protective coating of FLUID FILM will remain on the inner pump surfaces. Save the excess FLUID FILM for the next application. Plug the ports to keep out air during storage. For short periods of idleness, non-corrosive liquids may be left in the pump, but **AIR MUST BE KEPT OUT**. Plug ports or seal port connections.

Repair Instructions

Pump Housing Disassembly Instructions

1. Remove adapter from shaft and file off any burrs on pump shaft.
2. Remove both retaining rings that hold the shaft and shaft end bearing in place.
3. Remove the six (6) bolts that hold the body and housing together.
4. With the shaft end up, support the pump using the endplate support fixture (Part No. 3010-0002) or two blocks of wood. Place pump onto press and apply pressure on pump shaft. Press shaft out of front bearing only (about 1 inch). See Photo No. 1.

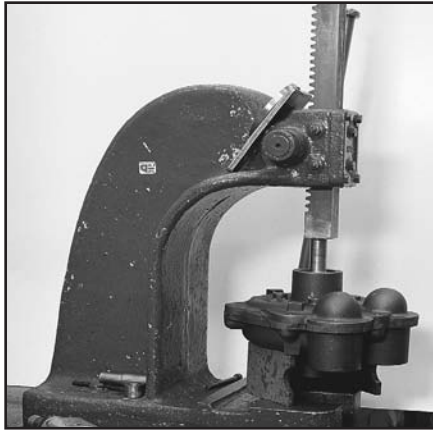


Photo No. 1

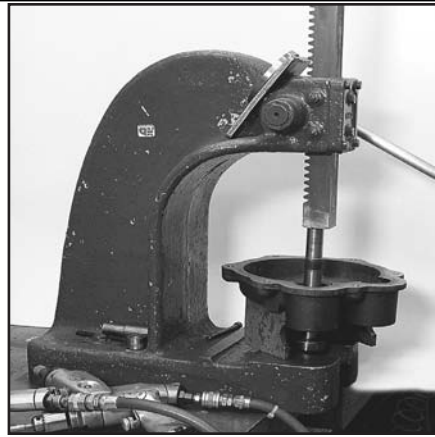


Photo No. 3

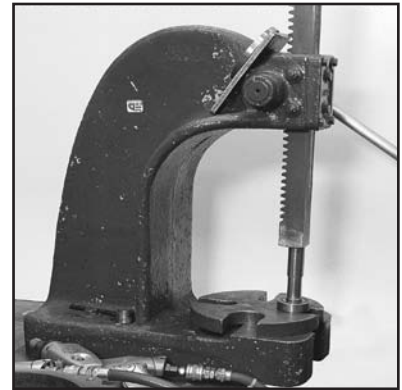


Photo No. 4

5. Remove pump body, exposing the impeller and internal parts. See Photo No. 2.

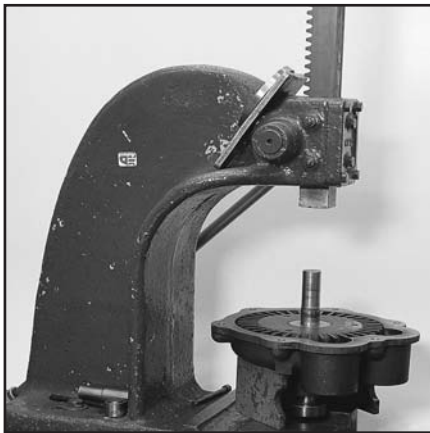


Photo No. 2

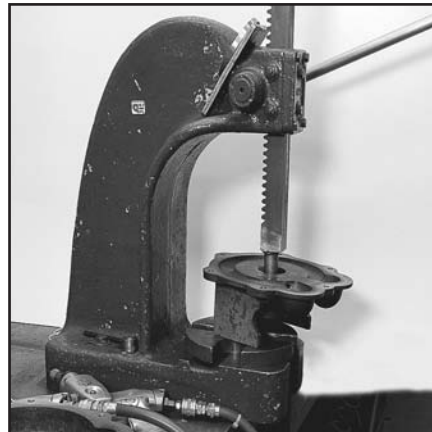


Photo No. 5

6. Remove impeller, impeller insert, impeller key and gasket.
7. With pump supported in press, press the shaft and back bearing the rest of the way out. Remove pump from press and pull shaft and bearing out of housing. See Photo No. 3.
8. To remove rear bearing from shaft, remove the back retaining ring and press shaft out of bearing. See Photo No. 4.
9. To remove bearing from pump body, support pump body in press and use bearing disassembling tool (Part Number 3010-0006) to press bearing out of body. See Photo No. 5.

10. Remove shaft seals with a punch or a screwdriver and hammer.
11. Clean all parts thoroughly, removing all internal rust and foreign material and inspect for wear and damage.

While Pump is Apart:

Carefully inspect all parts for wear, such as:

- a. Worn or swollen shaft seals
- b. Worn shaft at drive end; pitted or grooved shaft in the seal areas
- c. Rough bearings and loss of grease in bearings
- d. Worn impeller on sides, impeller blades, and splines for insert

Repair Instructions

- e. Excessive wear and pitting on body and housing in impeller area. Examine the area between ports (impeller sealing area) and faces of body and housing where impeller runs.
- f. Body and housing cracks
- g. Worn impeller insert splines, key and keyway
Decide if the pump is repairable after the parts have been inspected and various points have been considered.

Pump Reassembly Instructions

1. Shaft Seals

Smear a small amount of oil around edge of seal cavity in pump body and on lip of seal. Carefully lay seal in place, centered with lip side down. Press seal to bottom of cavity, using stepped end of the bearing and seal assembly tool (Part No. 3010-0005). Repeat this procedure with the housing seal. See Photo No. 6.

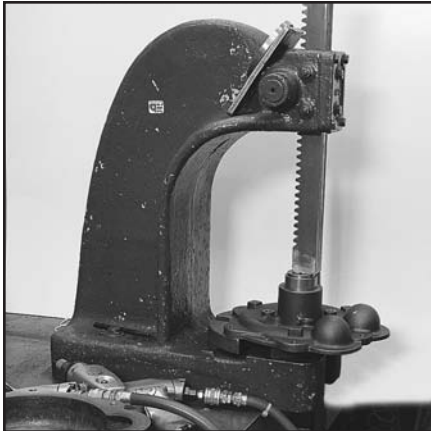


Photo No. 6

- 2. Install bearing into pump body by placing bearing in position. Press into place using counter bored end on bearing and seal assembly tool. Install retaining ring into groove to hold bearing in place.
- 3. Install housing bearing onto shaft end and install both retaining rings that hold bearing to shaft.
- 4. Support pump housing on press, and press shaft and bearing into place using bearing support tool (Part No. 3010-0020). See Photo No. 7.

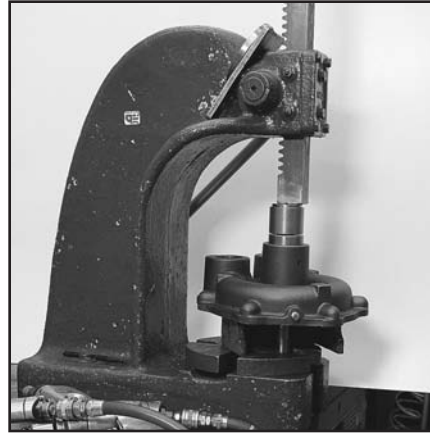


Photo No. 7

- 5. Lightly lubricate impeller sides, splines, shaft and insert. Install woodruff key, impeller insert, and impeller onto shaft in housing.
- 6. Place gasket onto sealing face of housing.
- 7. Place housing (with shaft facing upwards) onto bearing and seal assembly tool. Place pump body on top of housing and press body into place by using bearing support tool. See Photo No. 8.

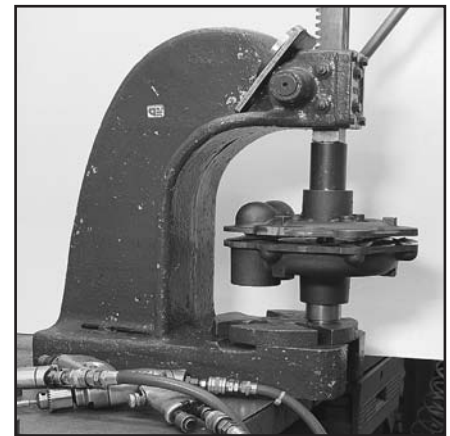


Photo No. 8

- 8. Install bearing retaining ring onto shaft.
- 9. Install and tighten the six (6) bolts holding the body to the housing.
- 10. Using a crescent wrench turn pump shaft until it turns smoothly.

9600C Performance Chart

RPM	20 PSI		30 PSI		40 PSI		50 PSI		60 PSI		70 PSI		80 PSI	
	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP	GPM	HP
800	44	2.0	31	2.4	19	3.0								
1000	65	3.0	57	3.6	46	4.0	35	4.9	28	5.7	19	6.5		
1200	88	4.4	78	5.1	73	5.8	63	6.6	55	7.3	47	8.2	40	9.1

• Notes •

• Notes •

Limited Warranty on Hypro Pumps and Other Hypro Products

Hypro ("Hypro") warrants to the original purchaser of its products (the "Purchaser") that such products will be free from defects in material and workmanship under normal use for the period of one (1) year for all products except: oil crankcase plunger pumps will be free from defects in material and workmanship under normal use for the period of five (5) years, and accessories will be free from defects in material and workmanship under normal use for the period of ninety (90) days. In addition, Hypro warrants to the purchaser all forged brass pump manifolds will be free from defects in material and workmanship under normal use and from damage resulting from environmental conditions for the life of the pump.

"Normal use" does not include use in excess of recommended maximum speeds, pressures, vacuums and temperatures, or use requiring handling of fluids not compatible with component materials, as noted in Hypro product catalogs, technical literature, and instructions. This warranty does not cover freight damage, freezing damage, normal wear and tear, or damage caused by misapplication, fault, negligence, alterations, or repair that affects the performance or reliability of the product.

THIS WARRANTY IS EXCLUSIVE. HYPRO MAKES NO OTHER WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Hypro's obligation under this warranty is, at Hypro's option, to either repair or replace the product upon return of the entire product to the Hypro factory in accordance with the return procedures set forth below. THIS IS THE EXCLUSIVE REMEDY FOR ANY BREACH OF WARRANTY.

IN NO EVENT SHALL HYPRO BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND, WHETHER FOR BREACH OF ANY WARRANTY, FOR NEGLIGENCE, ON THE BASIS OF STRICT LIABILITY, OR OTHERWISE.

Return Procedures

All pumps or products must be flushed of any chemical (ref. OSHA Section 0910.1200 (d)(e)(f)(g)(h)) and hazardous chemicals must be labeled before being shipped* to Hypro for service or warranty consideration. Hypro reserves the right to request a Material Safety Data sheet from the Purchaser for any pump or product Hypro deems necessary. Hypro reserves the right to "disposition as scrap" pumps or products returned which contain unknown substances, or to charge for any and all costs incurred for chemical testing and proper disposal of components containing unknown substances. Hypro requests this in order to protect the environment and personnel from the hazards of handling unknown substances.

For technical or application assistance, call the Hypro Technical/Application number: 1-800-445-8360. To obtain service or warranty assistance, call the Hypro Service and Warranty number: 1-800-468-3428; or call the Hypro Service and Warranty FAX: (651) 766-6618.

Be prepared to give Hypro full details of the problem, including the following information:

1. Model number and the date and from whom you purchased your pump.
2. A brief description of the pump problem, including the following:
 - Liquid pumped. State the pH and any non-soluble materials, and give the generic or trade name.
 - Temperature of the liquid and ambient environment.
 - Suction lift or vacuum (measured at the pump).
 - Discharge pressure.
 - Size, type, and mesh of the suction strainer.
 - Drive type (gas engine/electric motor; direct/belt drive; tractor PTO) and rpm of pump.
 - Viscosity (of oil, or other than water weight liquid).
 - Elevation from the pump to the discharge point.
 - Size and material of suction and discharge line.
 - Type of spray gun, orifice size, unloader/relief valve.

Hypro may request additional information, and may require a sketch to illustrate the problem. Contact the factory to receive a return material authorization before sending the product. All pumps returned for warranty work should be sent shipping charges prepaid to:

HYPRO
Attention: Service Department
375 Fifth Avenue NW
New Brighton, Minnesota 55112

*Carriers, including U.S.P.S., airlines, UPS, ground freight, etc., require specific identification of any hazardous materials being shipped. Failure to do so may result in a substantial fine and/or prison term. Check with your shipping company for specific instructions.



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SPRAY GROUP**

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