

# **HURCO**

TECHNOLOGIES, INC.

## **OWNERS MANUAL FOR HYDROSTATIC TEST PUMPS**



**HTP10-500 MEDIUM PRESSURE  
TWIN DIAPHRAGM PUMP**



**HTP 23-700 HIGH PRESSURE  
FOUR DIAPHRAGM PUMP**



**HTP 42-700 HIGH PRESSURE  
FOUR DIAPHRAGM PUMP**

**FOR PRESSURE TESTING OF  
WATERMANS,  
SEWER FORCE MAINS  
AND  
SERVICE CONNECTIONS**

# **WARNING!**

## **READ ALL OPERATING MANUALS BEFORE OPERATION OF EQUIPMENT**

### **GENERAL SAFETY INFORMATION**

- **WARNING:** This pump is for pumping water only. Pumping other fluids can be dangerous causing personal injury and will void all warranties.
- Do not pump at pressures higher than the maximum recommended pressures for the pump (see Specifications).
- Operate the pump between temperature range of 45 to 140 F.
- Never service or repair pump while running.
- Release all pressure within system before servicing any component.
- Drain all fluid from the system before servicing.
- Secure the discharge lines before starting the pump. An unsecured discharge line may whip, causing personal injury and/or property damage.
- Check hoses for weak or worn condition before each use. Make certain that all connections are tight and secure.
- Periodically inspect the pump and the system components. Perform routine maintenance as required (see Maintenance section).
- Do not operate a gasoline engine in an enclosed area. Be sure the area is well ventilated.
- Use only pipe, hose and fittings rated for the maximum rated pressure of pump or pressure at which pressure relief valve is set at. Check with local supplier for proper pressure rating. Do not use used pipe!
- Do not use these pumps for pumping water or other liquids for human or animal consumption.

## Pump Operation Instructions

- Be sure oil is half way up the clear oil sight tube. If necessary, fill to the correct level with a high-grade, non-detergent, SAE 30 weight oil.
- Make sure the suction hose is correctly connected to insure there are no air leaks.
- Check the charge pressure on the pulsation dampener before starting the pump. The pressure is checked with a standard automotive air gauge. The pressure should be at approximately 20% of the maximum operating pressure.
- Insert the suction hose into a tank of water being certain that the hose is unrestricted, or on our Twin Diaphragm pump you can connect the optional water reservoir. **DO NOT CONNECT SUCTION HOSE TO A PRESSURE SOURCE.**
- Always allow the pump to start under low pressure by putting the pressure release lever in the low-pressure position.
- Start the pump and let it run for approximately one minute at low pressure. Stop the pump and check the oil level in the sight glass. Add oil if necessary.
- Return the pressure release lever to the pressure position and adjust the pump to the desired pressure by changing the relief valve setting on the control unit.

## Connecting to a Live Line

- With all the valves in the closed position and the by-pass relief valve lever in the up position, (pressure relief position), start the engine.
- Move lever on the by-pass relief valve to the pumping position, (pull the lever down)
- Slowly open the Pressure Isolation valve and build pressure to desired level.

This is the only way to add pressure to a line that already has pressure in it without losing the existing pressure.

## CHLORINE INJECTION KIT

- Connect Chlorine Injector to the end of the pressure hose and the inlet to the piping system.
- Insert tubing into the liquid chlorine.
- Open valve and adjustable Chlorine Injector Valve to begin flow from the pump and start pumping water into the system. The Chlorine Injector will allow up to 5 GPM water flow through the injector.
- Chlorine will be injected into the system at a maximum rate of  $\Omega$  GPM (10% of water flow).

## CONTROL UNIT OPERATION

### HTP10-500 TWIN DIAPHRAGM CONTROL UNIT – MODEL 9910-GS40GI

Adjust the pressure by clamping the relief valve adjustment lever down. With the bale hook in the number one position, the pressure is about 100 psi, number two position is about 250 psi, number three position is about 450 psi, and number four position is about 550 psi. These pressures can be adjusted by using the fine adjustment knob located on top of the relief valve spring. The fine adjustment knob can be rotated when the relief valve lever is in the up position.



## **HTP23-700 FOUR DIAPHRAGM CONTROL UNIT MODEL 9910-VDR50**

The control unit can be put into full bypass mode by turning the pressure release lever counter-clockwise as far as it will go. With the pressure release lever rotated clockwise to pressure position, pressure can be adjusted by rotating the pressure adjustment knob clockwise for more pressure or counter clockwise for less pressure. Flow can also be controlled by ball valve on outlet side of pump.



## **MAINTENANCE INSTRUCTIONS**

1. After usage, flush the pump with a neutralizing solution for the liquid just pumped. Follow with a clear water rinse. This is especially important for corrosive chemicals such as chlorine. Then flush out the pump with a 50% solution of automotive radiator anti-freeze, (ethylene glycol type such as Prestone, Zerex, etc.), containing a rust inhibitor or use a commercial rust inhibitor such as FLUID FILM. Anti-freeze not only coats the interior of the pump with an inhibitor, but acts as a lubricant as well, keeping valves from sticking and protecting against any remaining moisture freezing in cold weather.
2. Diaphragm pumps come with oil in the crankcase. It is recommended to change the oil after 40 hours of break-in operation and every three months or 500 hours, whichever comes first. Use a high grade, non-detergent, SAE 30 weight oil. To drain oil from the pump, remove the drain plug and the sight glass cover and rotate shaft until the oil stops flowing out. To fill the pump with oil, slowly pour oil into sight tube while turning the pump shaft. Turning the pump shaft purges all the air out of the crankcase. Always change oil when replacing diaphragms.
3. For winter storage or if a freezing condition will be encountered, flush pump with a 50/50 mixture of water and anti-freeze
4. Gear Reduction Crankcase, use 90W Gear Lube. To properly fill, remove side level plug and the vent plug. Fill until the gear lube is no higher than the mark on the dipstick. Replace and tighten the side level plug and the top vent plug.

## **DIAPHRAGM AND VALVE REPLACEMENT**

### **I Valve and O-ring Replacement**

Occasionally debris can cause the valves to not seat properly or damage the o-rings. To check for this problem, follow these steps.

#### **HTP10-500**

Remove the pump manifolds. With the manifolds removed, valves can easily be removed and inspected for debris and wear. Replace valves, o-rings and manifolds

#### **HTP23-700**

Remove valve retainers and valve holders. With holders removed, the valves can readily be removed and checked for debris and wear. Check o-rings as well. Replace the necessary parts and reassemble.

### **II Diaphragm Replacement**

Change diaphragms every 500 hours or three months, whichever comes first.

### HTP10-500

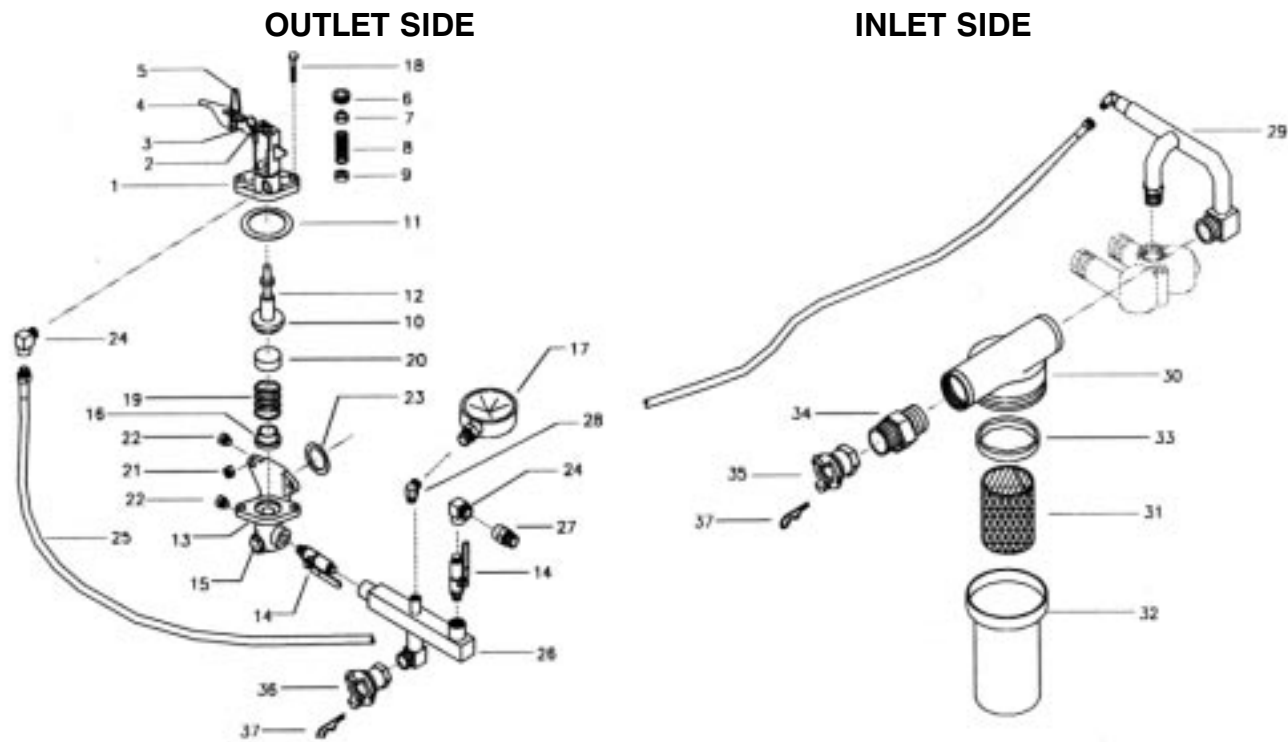
1. Drain the oil as instructed previously.
2. Remove the pump manifolds and valves.
3. Remove the pump head retaining nuts and heads.
4. Turn the crankshaft to bring the diaphragm to the top of its stroke. Insert a drift pin into the hole in the retaining stud to hold it in place. Remove the retaining washer and the diaphragm.
5. Turn the crankshaft to bring the piston to the bottom of its stroke and seat the new diaphragm into the sleeve groove. Install the retaining washer and tighten the retaining nut while holding the retaining stud in place with the drift pin. Clean any excess oil from the area and install heads, valves and manifolds.
6. Replace the pulsation dampener diaphragm by first bleeding the air from the dampener. Remove the cover retaining bolts from the dampener cover and replace the diaphragm. Reassemble the cover and bolts in place and charge the dampener to 20% of operating pressure.
7. Refill crankcase with non-detergent 30-weight oil. Rotate shaft to distribute oil and fill to proper level.

### HTP23-700

1. Drain the oil from the pump by removing the cap from the sight tube and removing excess oil.
2. Remove the head bolts and heads.
3. Turn the crankshaft to bring the retaining bolt as far out as possible.
4. Use a 13 mm box wrench to remove the diaphragm retaining bolt. Remove the bolt, retaining washer and diaphragm.
5. When reinstalling, turn the crankshaft to bring the piston to its down stroke and seat the new diaphragm into the sleeve groove. Install the retaining washer and tighten the bolt. Clean any excess oil from the area. Install the new port o-rings, install the heads and tighten bolts.
6. Replace the pulsation dampener diaphragm by first bleeding the air from the dampener. Remove the cover holding the dampener assembly together, and then replace the diaphragm.
7. Refill the crankcase with non-detergent 30-weight oil. Rotate the shaft to distribute the oil and fill to the proper level.

## TROUBLESHOOTING

SYMPTOM	PROBABLE CAUSES	CORRECTIVE ACTION
Pump does not draw water.	Suction Line is plugged or collapsed. Clogged Strainer. One or more Valves are seating improperly.	Examine and clean the Suction Line. Clean the Strainer. Remove Valve and check for debris.  Remove any debris found. Examine the Valve seatings and clean them.
The liquid flow is irregular.	One or more Valves are seating improperly.  The charge in the Pulsation Dampener is incorrect.	Remove Valve and check for debris. Remove any debris found. Examine the Valve seatings and clean them.  Check the pressure in the Pulsation Dampener (it should be 20% of your operating pressure).
Output drops and the Pump is noisy.	The oil level is too low.	Add oil to the correct level (halfway up the Sight Tube).
Oil comes out of the Discharge Port or oil is a milky color.	One or more Diaphragms have split.	Remove the Manifold and Heads. Drain the oil and clean the Crankcase of water. Replace the Diaphragms, Heads, and Manifold. Refill with 30 weight, non-detergent oil.

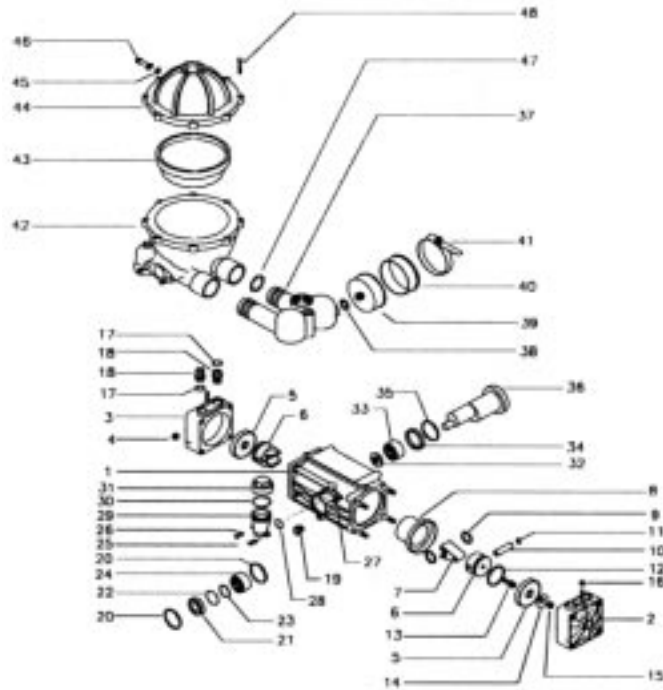


**HURCO TECHNOLOGIES  
HTP10-500 CONTROL UNIT PARTS BOOK**

REF NO.	Part NO.	DESCRIPTION	NO REQD	REF NO.	PART NO.	DESCRIPTION	NO REQD.
1	9910-320410	tension spring housing	1	19*	9910-320420	tension spring	1
2	9910-320480	pin	1	20*	9910-110121	relief valve seat	1
3	9910-390460	lever guide	1	21	9910-390270	nut	2
4	9910-320470	pressure relief lever	1	22	4200-111,112	plug	2
5	9910-320490	locking clip	1	23	9910-550350	o-ring	1
6	9910-320450	pressure adjustment nut	1	24	4200-110	90 degree elbow	2
7	9910-320440	threaded guide	1	25	4200-124	hose	1
8	9910-110190	tension spring	1	26	4200-107	pressure manifold	1
9	9910-230120	tension spring retainer	1	27	4200-118	hose bushing	1
10*	9910-320433	relief valve poppet retainer	1	28	4200-108	45 degree elbow	1
11*	9910-320511	gasket seal 0-ring	1	29	4200-106	filter manifold	1
12*	9910-390140	tension spring guide/seal	1	30	3351-0014	filter body	1
13	9910-620220	relief valve body	1	31	3800-0041	filter	1
14	9910-130492	ball valve	2	32	3351-0024	filter bowl	1
15	9910-130171	plug	1	33	1700-0057	filter gasket	1
16*	9910-450110	spring holder	1	34	4200-117	1" straight fitting	1
17	4200-109	pressure gauge/oil filled	1	35	4200-114	1" coupler	1
18	9910-180370	bolt	2	36	4200-113	1/2" coupler	1
				37	AC-1	r-clip	2

**REPAIR AND MAINTENANCE KIT AVAILABLE:**

\* Control unit parts kit no. 9910-KIT 1757 consists of: ref. 10 (1 ea.) relief valve poppet retainer, ref. 11 (1 ea.) gasket seal o-ring, ref. 12 (1 ea.) tension spring guide, ref. 16 (1 ea.) spring holder, ref. 19 (1 ea.) tension spring, ref. 20 (1 ea.) relief valve seat.



## HURCO TECHNOLOGIES HTP10-500 PUMP PARTS MANUAL

REF NO.	Part NO.	DESCRIPTION	NO REQD	REF NO.	PART NO.	DESCRIPTION	NO REQD.
1	9910-629011	pump body	1	25	9910-390440	nut	2
2	9910-620101	head assembly (right hand)	1	26	9910-550331	washer	2
3	9910-620102	head assembly (left hand)	1	27	9910-550330	stud	2
4	9910-320130	nut	8	28*	9910-180101	o-ring	1
5#>	9910-620080	diaphragm	2	29	9910-550030	oil sight glass	1
6	9910-620120	piston	2	30*	9910-550040	o-ring	1
7	9910-620140	connecting rod	2	31	9910-550056	cap for sight glass	1
8	9910-620110	piston sleeve	2	32	9910-620160	spacer washer	1
9	9910-580130	retainer ring	2	33	9910-550060	roller bearings	1
10	9910-380300	connecting rod pin	2	34	9910-620130	seal	1
11	9910-380080	retainer ring	4	35	9910-620330	retainer ring	1
12	9910-160230	piston ring	2	36	9910-620170	crankshaft	1
13	9910-580360	retaining bolt	2	37	9910-620150	manifold	1
14	9910-1040180	retaining washer	2	38	9910-180101	o-ring	1
15	9910-550131	locknut	2	39*	9910-650660	dampener body	1
16	9910-180150	nut (10MA)	2	40	9910-650670	dampener diaphragm	1
17>+ #*	9910-62003	o-ring	4	41	9910-650690	clamp	1
18+	9910-1409050	check valve assembly	4	42	9910-622070	accumulator manifold	1
19	9910-130171	drain plug	1	43*> #	9910-550190	accumulator diaphragm	1
20	9910-11120	retainer ring	1	44	9910-629211	accumulator head	1
21	9910-620026	oil sealing cap	1	45*	9910-650542	o-ring	1
22*	9910-620210	0-ring	1	46	9910-180020	air valve	1
23	9910-620291	retaining ring	1	47*	9910-390060	o-ring	4
24	9910-620190	ball bearing	1	48	9910-621780	bolt	8

### REPAIR & MAINTENANCE KITS AVAILABLE:

\*O-ring parts kit no. 9910-KIT1916 consists of these o-rings: ea.)ref. 17 (4 ea.), ref. 22 (1 ea.), ref. 28 (1 ea.), ref. 30 (1 ea.) ref. 47 (4 ea.), ref 45 (1 ea.)

#Diaphragm parts kit no. 9910-KIT2110 consists of: ref. 5 (2 ea.) Diaphragm, ref. 17 (4 ea.) o-rings, ref. 43 (1 ea.) Accum. Dia.

>Diaphragm parts kit no. 9910-KIT1724 consists of: ref. 5 (2 Diaphragm, ref. 17 (4 ea.) o-rings, ref. 43 (1 ea.) Accumulator Diaphragm

+Valve parts kit no. 9910-KIT1917 consists of: ref. 17 (4ea.) o-rings, Ref. 18 (4ea.) valves.

## LIMITED WARRANTY FOR HURCO PUMPS

Hurco Technologies 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, and accessories will be free from defects in material and workmanship under normal use for a period of ninety (90) days.

Normal use does not include use in excess of recommended maximum speeds, pressures, temperatures, or use requiring handling of fluids not compatible with component materials, as noted in product catalogs, technical literature, and instructions. This warranty does not include freight 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. Hurco makes no other warranty, express or implied, including but not limited to any warranty merchantability or fitness for a particular purpose.**

Hurco's obligation under this warranty is, at Hurco's option to either repair or replace the product upon return of the entire product to the Hurco factory in accordance with the return procedures set forth below. **This is the exclusive remedy for any breach of warranty.**

**In no event shall Hurco 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 Hurco for service or warranty consideration.** Hurco reserves the right to request a Material Safety Data sheet from the Purchaser for any pump or product Hurco deems necessary. Hurco 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. Hurco requests this in order to protect the environment and personnel from the hazards of handling unknown substances.

For technical or application assistance, call:  
**Hurco Technologies 800-888-1436.**

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

1. Model number, serial number, and the date and from whom you purchased the pump.
2. A brief description of the pump problem, including the following:
  - \* Liquid pumped. State the pH and any non-soluble materials, give the generic or trade name.
  - \* Temperature of the liquid and ambient environment.
  - \* Discharge pressure.
  - \* Motor type and make, model and code found on motor.

Hurco may request additional information. Consult 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:



**HURCO TECHNOLOGIES, INC.**

Attention: Service Department  
409 Enterprise Street  
Harrisburg, SD 57032

- \* 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 your shipping company for specific instructions.

**Motor Warranty**

Please refer to your specific motor Owners Manual for warranty and handling information. All motor warranty and repairs are performed by authorized service centers in your specific location. Do not return motor warranty or repair to Hurco Technologies, Inc.

# Performance Charts

## Model HTP10-500

PSI	GPM	BAR	L/M
50	9.5	3.5	36
100	9.3	7	35.2
200	9.1	14	34.5
300	9	21	34
400	8.7	28	33
500	8.45	38.5	32

## Model HTP23-700

PSI	GPM	BAR	L/M
0	27.9	0	105.6
435	27.6	30	104.3
580	27.2	40	103.0
725	26.7	50	101.0

## ENGINE CAPACITIES

PSI	GPM	BAR	L/M
100	42.3	7	160
300	41.7	21	157.8
500	40.6	35	1532.7
725	40.1	50	151.8



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