

# MAGNUM 620D PUMP

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## Operation / Maintenance Manual

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# 1 INSTALLATION

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## 1.1 UNPACKING

After unpacking, the pump should be checked for any damage that may have occurred during shipment. Damage should be reported to the carrier immediately.

The following items should be included within the shipping container:

<u>Qty</u>	<u>Item</u>	<u>Description</u>
1	620	Magnum 620 Pump

## 1.2 UTILITIES / HOOK-UP

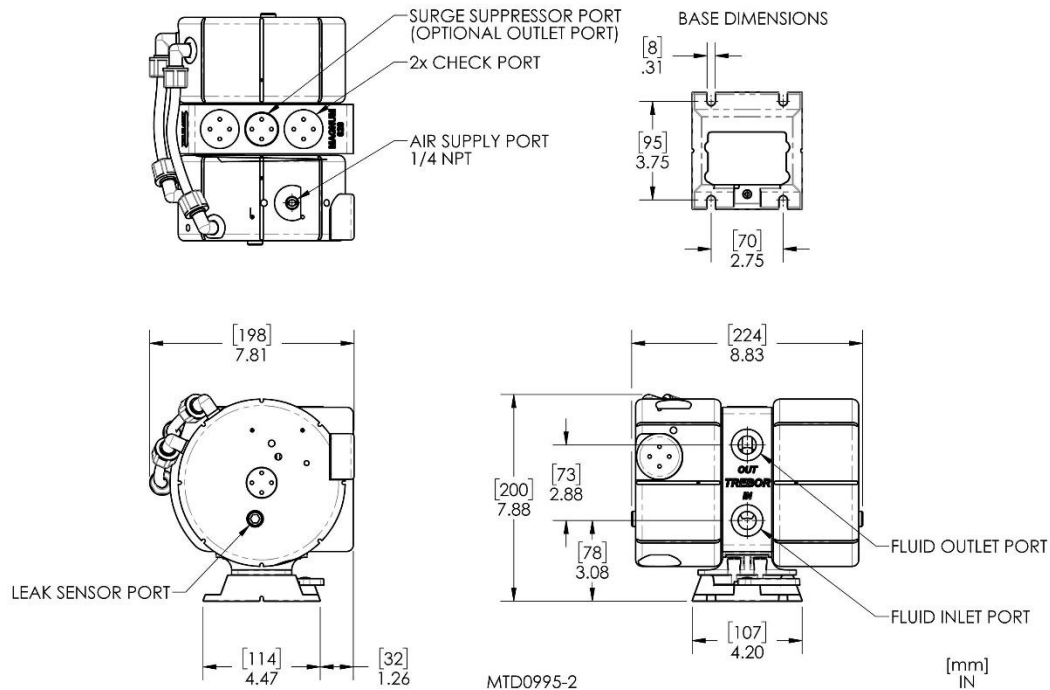
It is recommended that the pump be positioned within 15° from level to maintain self-priming ability and pumping efficiency. Allow sufficient room for tubing connectors. The pump mounts on a quick-change base for easy installation.

The pump has an exhaust location on the backsides of the master and slave heads. The exhaust location requires 1/2" (12mm) minimum clearance behind the master head. Care should be taken to prevent flooding the exhaust port when the pump is located in a wet bench plenum.

**Air Inlet:** 1/4" FNPT (3/8" Dia. [8mm] supply tube minimum).

**Air Supply:** 28-80 psig (1.7 – 5.5 bar) clean dry air or nitrogen (see Performance Charts, Section 3.1).

**Fluid Ports:** 1" NPSM – additional adaptor port options available.  
Inlet/Outlet adaptor fittings and Surge Suppressor require torquing during pump installation. See Section 2 for hook-up diagram and torque values.



**ATTENTION:** The pump should be operated with clean, dry air or nitrogen. Particulate, water and oils in the air supply can damage the pump.

**NOTE:**

1. It is recommended that a filter be placed on the discharge side of the pump.
2. Although extensive efforts are made to deliver pumps to our customers completely dry, new pumps may contain residual moisture from their final DI water test.

**Recommended Maximum Operating Levels:**

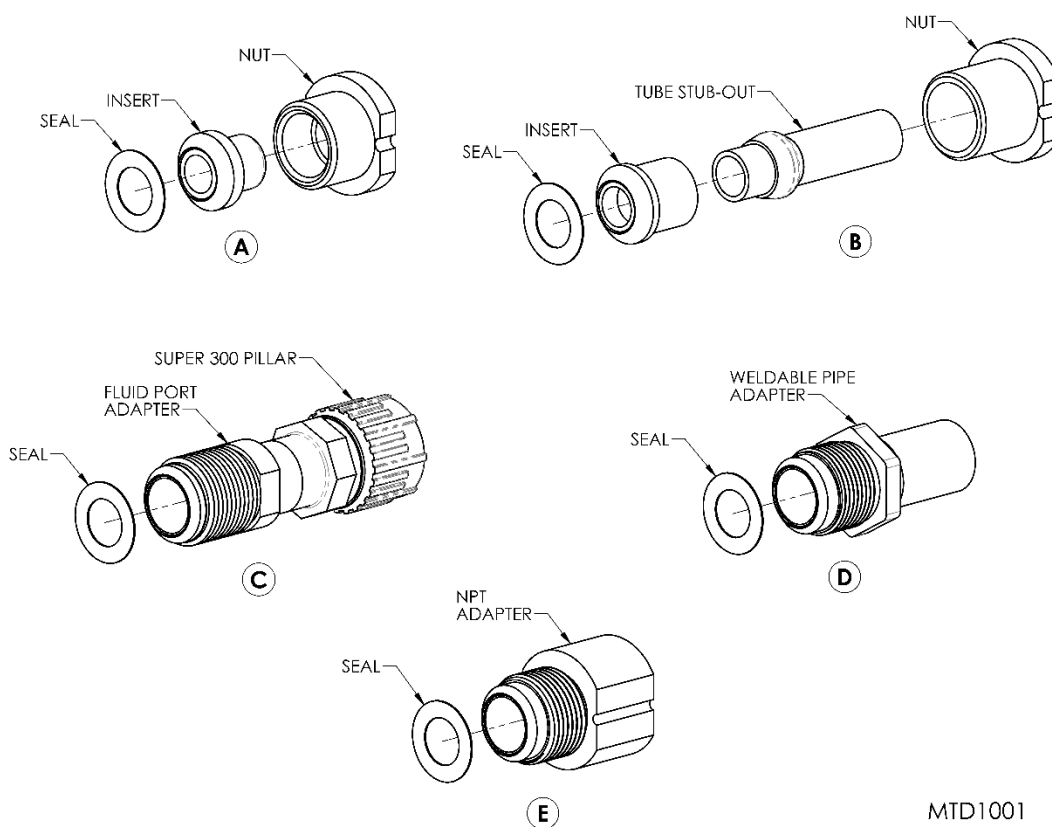
Temperature Range	Supply Pressure Max
< 60°C	80 PSI (5.5 bar)
60°C - 100°C*	60 PSI (4.1 bar)
*100°C Maximum Fluid Temperature	

## 2 OPTIONS

### 2.1 FLUID PORT CONNECTION OPTIONS

#### Available Options

- A) Flare style tube adapter....1/2", 3/4", 1"
- B) PFA tube stub out.....3/4"
- C) Pillar Super 300.....3/4", 1"
- D) PFA weldable pipe.....3/4"
- E) NPT adapter nut.....3/4"

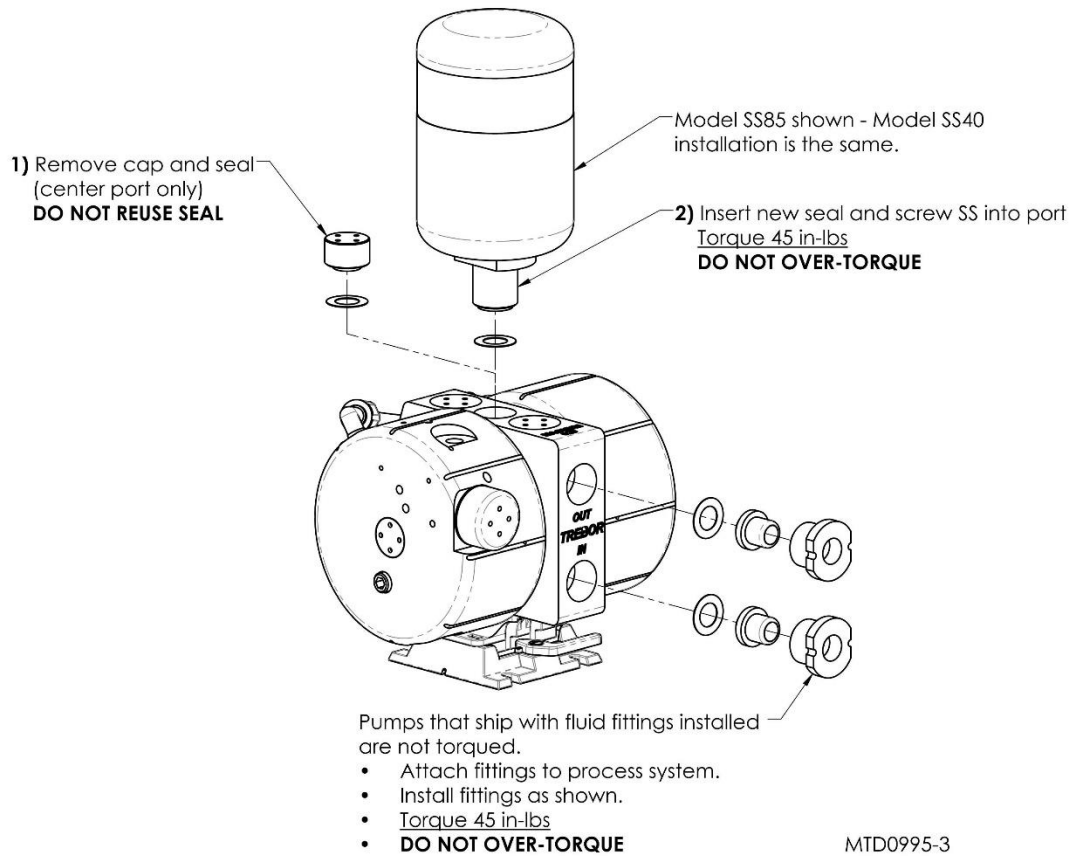


MTD1001

**Figure 2-1 Fluid Port Connection Options**

## 2.2 FLUID FITTINGS / SURGE SUPPRESSOR HOOK-UP

<u>Surge Suppressor</u>	<u>Assembled Height: IN (CM)</u>
MODEL SS40	12.63 (32.08)
MODEL SS85	14.97 (38.02)



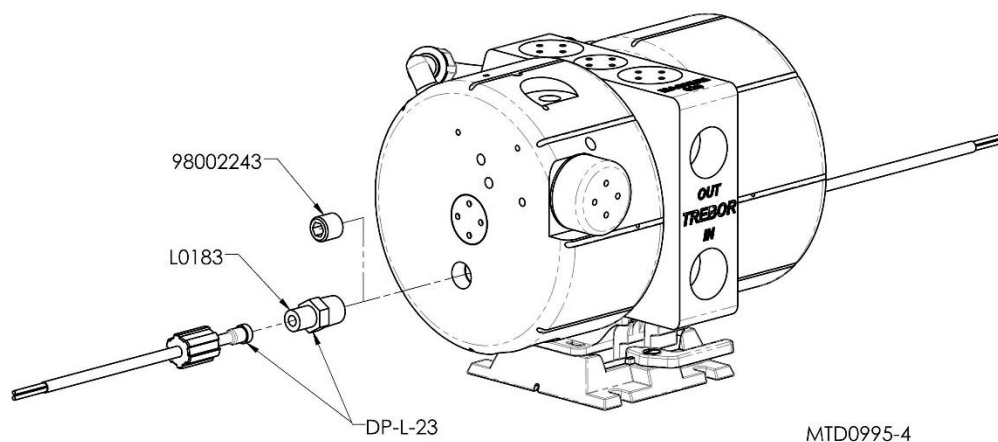
**Figure 2-2 Fitting/Surge Suppressor Installation**

**NOTE:** See Surge Suppressor Operation Manual for detailed installation instructions.

## 2.3 OPTIONAL LEAK SENSING

### 2.3.a Installation

- Remove leak port plug (98002243) from each head.
- Install probe fitting (L0183) of the leak probe assembly (DP-L-23) into the leak port of each head.
- Thread the leak probe onto the probe fitting (L0183).
- Torque the nut of the leak probe assembly hand-tight.
- Connect fiber optic cable to sensor (NOTE: Minimize bends in fiber optic cable to 2" radius minimum to help ensure optimum signal strength.). Fiber optic cable can be cut to desired length using the cable cutter provided.

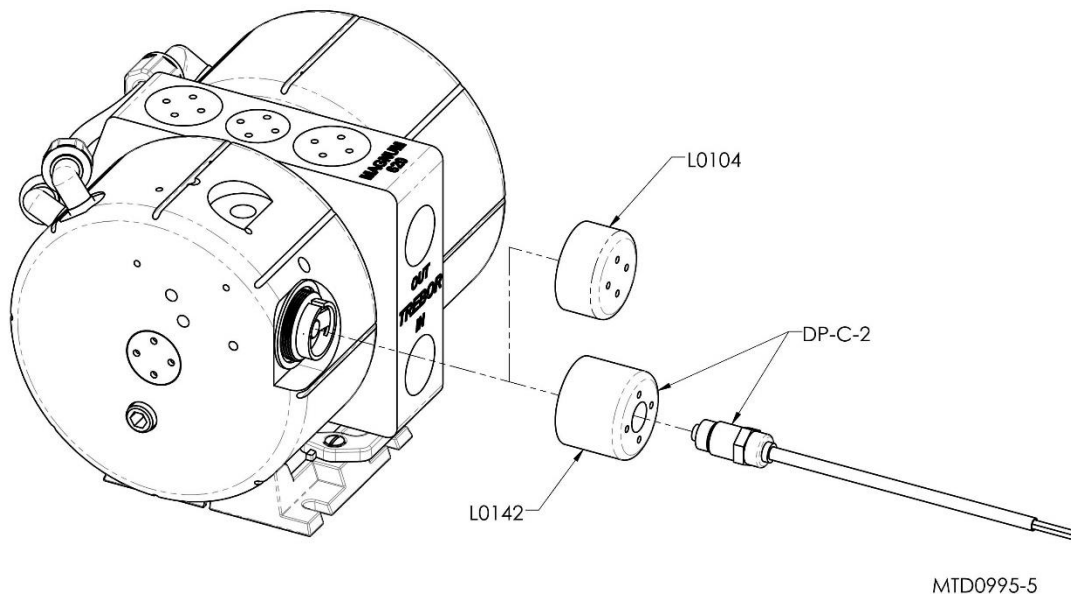


**Figure 2-3 Leak Probe Installation**

## 2.4 OPTIONAL CYCLE SENSING

### 2.4.a Installation

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the shuttle cap (L0104).
- Using 1" pin tool (T0147), install the cycle probe cap (L0142) of the cycle probe assembly (DP-C-2). Torque to 40 IN-LBS.
- Thread the cycle probe into the cycle probe cap (L0142).
- Torque the cycle probe assembly hand-tight.
- Connect fiber optic cable to sensor (NOTE: Minimize bends in fiber optic cable to 2" radius minimum to help ensure optimum signal strength.). Fiber optic cable can be cut to desired length using the cable cutter provided.



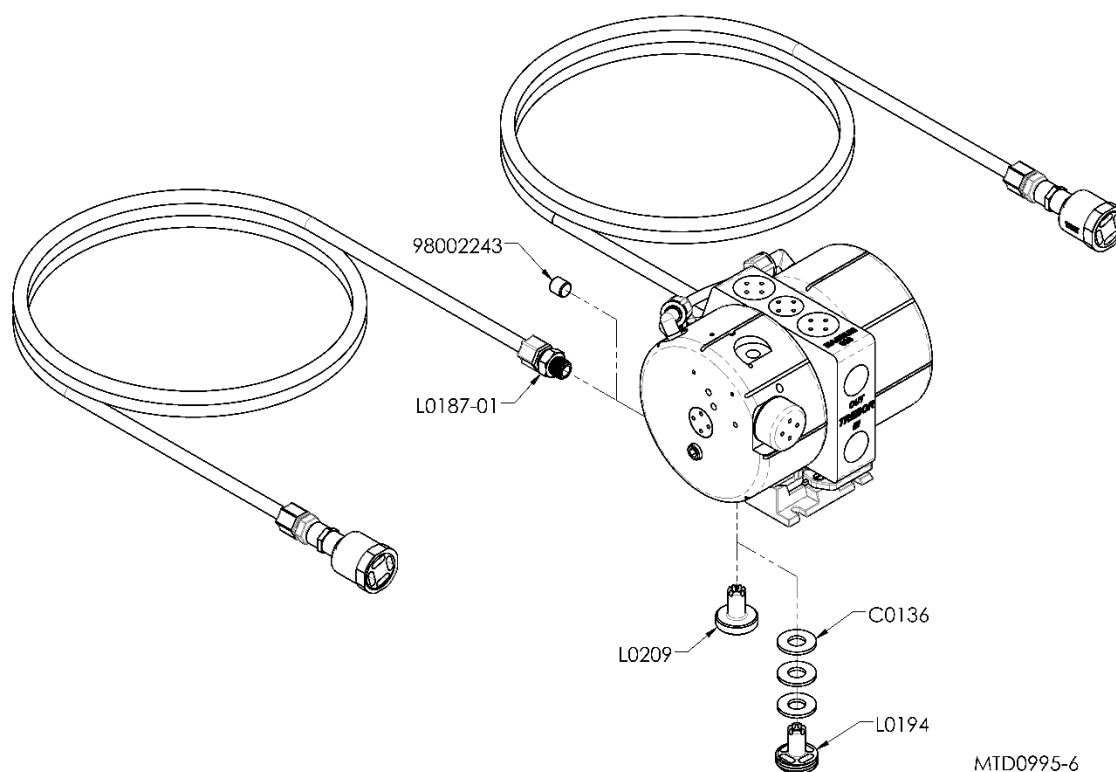
**Figure 2-4 Cycle Probe Installation**



## 2.5 OPTIONAL REMOTE EXHAUST

### 2.5.a Installation

- Using the 1" pin tool (T0147), remove the muffler spools (L0194) and muffler pads (C0136) from each head.
- Using the 3/4" pin tool (T0146), install the remote exhaust plugs (L0209) into each head. Torque the remote exhaust plugs (L0209) to 40 IN-LBS.
- Remove remote exhaust plug (98002243) from each head.
- Install remote exhaust (L0187-01) into the remote exhaust port of each head.



**Figure 2-5 Remote Exhaust Installation**

## 2.6 MAGNETIC SHUTTLE

*\*Our magnetic shuttle provides more stable long-term operation than mechanical shuttles, which may require periodic replacement over time. While some pumps may show slightly higher start pressures with the magnetic shuttle, overall performance remains effectively unchanged.*

### Conversion Kits

KUL0131 – Converts Standard Pumps to Magnetic Shuttle

KUDP-C-2 – Converts Pumps with Cycle Probe to Magnetic Shuttle

### Rebuild Kit Item Number Changes

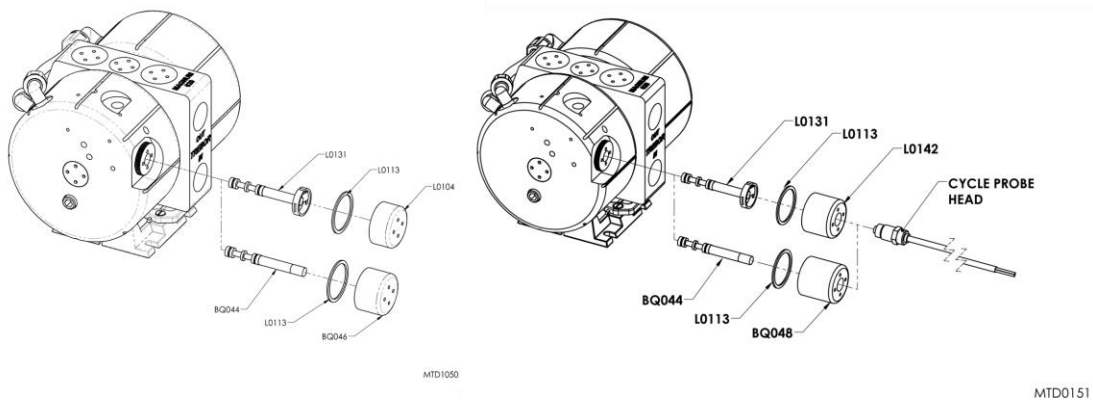
\*Contact Trebor Technical Support to ensure correct kit is purchased

**\*TO ORDER REPLACEMENT PUMPS WITH MAGNETIC SHUTTLE CONSULT FACTORY FOR NEW ITEM NUMBER**

### Installation Instructions

- Figure 1-1 shows an exploded view of the shuttle assembly, with mechanical components at the top and magnetic components at the bottom. The left image illustrates the standard shuttle configuration, while the right image depicts the configuration required when a cycle probe is installed.
- If removed, thread detent adapter into shuttle bore until flush against head.
- Tighten detent adapter to 45 in-lbs.
- Insert shuttle spool assembly (BQ044) into shuttle adapter and shuttle sleeve. (Do not lubricate.)

**NOTE:** Ensure that the spool moves freely inside the sleeve prior to installation.



**Figure 1-1**

- Install the seal (L0113) onto seal groove shoulder of the shuttle cap (BQ046 or BQ048).
- Thread shuttle cap onto detent adapter. Tighten to 40 in-lbs.

**ATTENTION:** Threads should be snug. Do not over tighten.

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## 3 START-UP

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- Pump air supply pressure must be regulated.
- Open the fluid suction (IN) line valve, if necessary.
- Open the fluid discharge (OUT) line valve, if necessary.
- Start slowly with air regulator at low (> 25 psi) pressure setting. Increase pressure to attain desired flow, up to the maximum rating (See Section 3.1).
- Refer to Troubleshooting, Section 5, if pump fails to start.

**ATTENTION:** Prolonged periods (> 5 minutes) of dry running can damage critical internal pump parts.

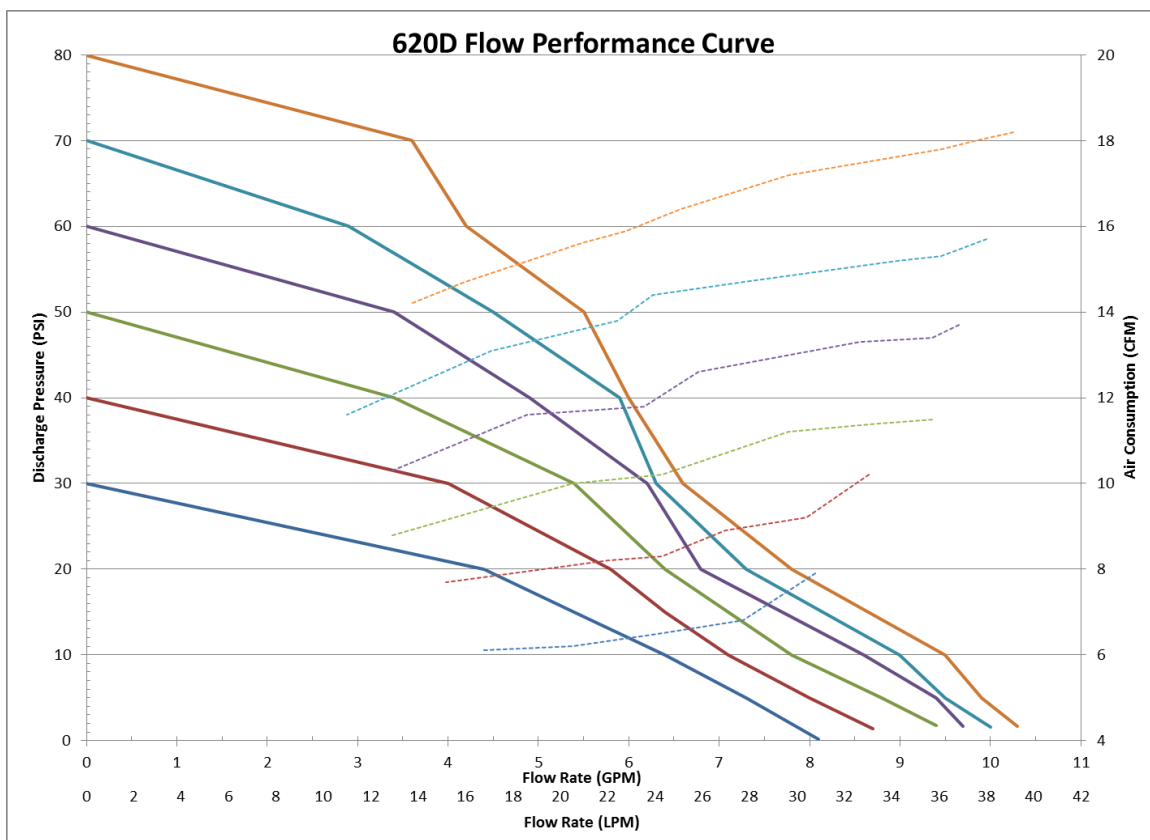


**CAUTION:** When handling potentially dangerous fluids under pressure, the pump and its fittings should be placed in an enclosure away from operators.

### 3.1 PERFORMANCE CHARTS

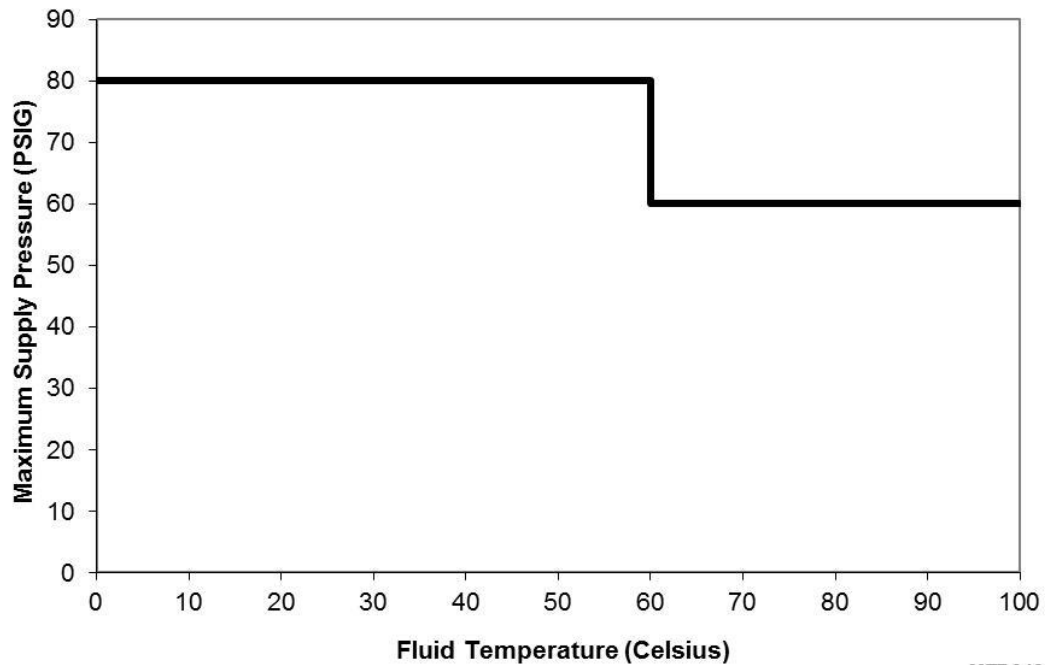
Pumping capacity is a function of air supply pressure and volume, suction head, suction line restrictions, discharge head, discharge line restriction, and fluid specific gravity and viscosity.

**NOTE:** Specification to be used to size regulators and control valves.



**Figure 3-1 Flow Performance Curves**

**NOTE:** Test information is based on specific conditions and limited sampling. Use for general reference only.



**Figure 3-2 Max Operating Pressure vs. Fluid Temperature**

**NOTE:**

1. This graph is not representative of all operating conditions – customer's specific application results may vary.
2. Be sure that fittings and tubing used are capable of these operating conditions.

## **4 MAINTENANCE**

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Trebor pump maintenance can be divided into two categories: air system maintenance and fluid system maintenance. The purpose of air system maintenance is to prevent air system failures such as stalling or erratic cycling. The purpose of fluid system maintenance is to maintain suction and lift capabilities.

### **Pump Rebuild Service**

Trebor International provides a factory rebuild service for customers using Trebor products. Trebor will rebuild any standard pump (exclusive of options). Please contact Trebor International Sales Department for current rebuild pricing. The fixed rebuild price includes a factory rebuild and parts equivalent to the standard rebuild kit. Each factory rebuild comes with a new one-year warranty. Repairs requiring more extensive part replacements will be quoted prior to proceeding with the pump rebuild. If the pump has exceeded its useful life and cannot be rebuilt, the customer may elect to purchase a new Trebor pump. If the customer chooses not to rebuild or replace the pump, an evaluation charge will be required.

All returned pumps are to be shipped freight prepaid with a valid Purchase Order for the cost of rebuild service. Please contact Trebor International prior to returning your pump to obtain an RMA Number and Pump Return Data Sheet to ensure proper safety precautions. Each pump will be evaluated and repaired within 5 working days of the receipt of pump at Trebor facility.

### **4.1 PREVENTIVE MAINTENANCE SCHEDULE**

The following maintenance schedule is recommended to optimize pump performance and minimize failures. Certain operating conditions that require more frequent maintenance intervals have been noted. In positive pressure inlet conditions where suction or lift is not required, fluid system maintenance may be extended.

Adhering to the recommended preventative maintenance schedule along with periodic inspection of the pump will ensure continued efficient operation and overall reliable pump performance.

It is recommended that the Preventive Maintenance Record (Section 4.1.a) be copied, maintained and kept with this unit for future reference.

## MAGNUM 620D Maintenance Schedule

	Install	30 Days	3 Months	6 Months	9 Months	12 Months	15 Months	18 Months	21 Months	24 Months
Pilot Button						R				
C-Ring and Detent Legs						R				
Muffler Media										R
Shaft Seal and Shaft										R
Check Balls and O-Rings										R
Diaphragms										R
Check Plug Seal										R
Suction and Discharge Check Cage										I
I=Inspect, R=Replace										

#### 4.1.a Preventive Maintenance Record

Company Name: \_\_\_\_\_

Company Address: \_\_\_\_\_

Product: \_\_\_\_\_ Serial Number: \_\_\_\_\_

Date: \_\_\_\_\_ Tech: \_\_\_\_\_ Notes: \_\_\_\_\_

Date: \_\_\_\_\_ Tech: \_\_\_\_\_ Notes: \_\_\_\_\_

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## 4.2 RECOMMENDED SPARE PARTS

**KR620D-00-A Spares Rebuild Kit**, which includes:

<u>Part No</u>	<u>Qty</u>	<u>Description</u>
KM620D-00-A	1	<b>Maintenance Kit</b>
		Includes: (2) 1900B0016 Quick Exhaust Port
		(2) 98002987 Pilot Button
		(2) 98003047 Quick Exhaust Seal
		(2) L0197 Detent Legs
		(1) L0145 Detent Ring
		(6) C0136 Muffler Pad
KD620D-00-A	1	<b>Diaphragm Kit</b>
		Includes: (2) AW105 Diaphragm
98001415	4	Check Ball
98002334	4	O-ring, PTFE
98003322	2	Shaft Seal
AW072	1	Shaft
AM083	2	Check Cap Seal
AW017	1	Damper Port Seal

## 4.3 TOOLS

The following tool kit is recommended as standard service equipment.

**KT620-00-A Tool Kit**, which includes:

<u>Part No</u>	<u>Qty</u>	<u>Description</u>
98003108	1	Torque Wrench, 30-150 ft/lb., 1/2" Drive Handle
98003150	1	Tool Case
98003305	1	Drive Handle
T000B0014	1	Check Sleeve Removal Tool
T0129	1	Strap Wrench
T0146	1	3/4" Pin Tool
T0147	1	1" Pin Tool
T0148	1	1/2" Pin Tool
T0154	1	Check Sleeve Insertion Tool
T0155	1	Shaft Bullet
T0157	1	Rebuild Fixture
T0144	1	Cleaning Tool

## 4.4 PARTS ILLUSTRATION

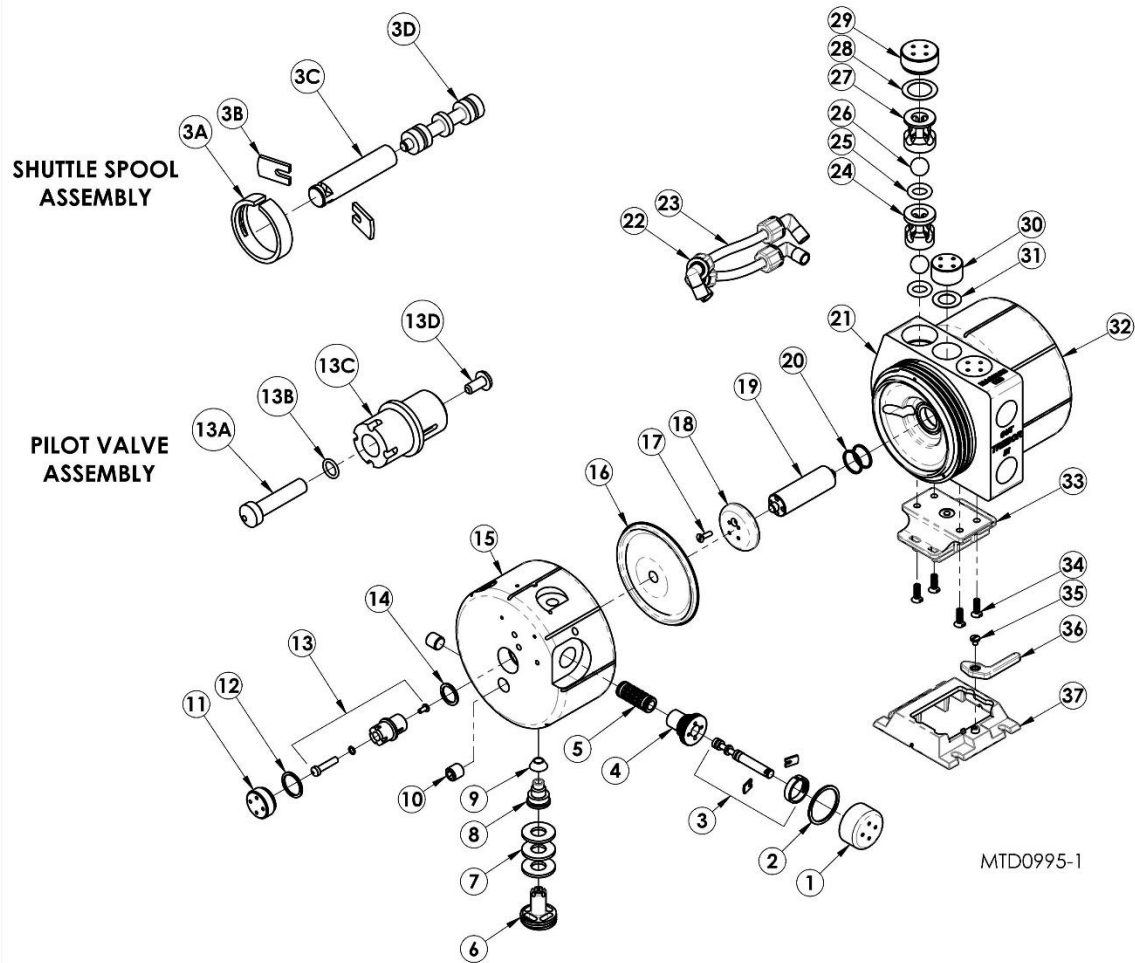


Figure 4-1 Exploded View

## 4.5 PARTS LIST

ILL NO	PART NO	QTY	DESCRIPTION	PM YEAR #	MATERIAL
1	L0104	1	Shuttle Cap		PP
2	L0113	1	Shuttle Cap Seal		PTFE
3	L0131	1	Shuttle Spool Assembly		
3A	L0145	1	Ring, Detent, High Load	1	PEEK
3B	L0197	2	Leg, Detent	1	Torlon
3C	L0189	1	Shuttle Spool Stem		PEEK/PPS
3D	W0064	1	Shuttle Spool		Ceramic
4	L0105	1	Detent Adapter		PP
5	AK058	1	Shuttle Sleeve Assembly		Ceramic, PTFE
6	L0194	2	Muffler Spool		PP
7	C0136	6	Muffler Pad	2	PP
8	1900B0016	2	Quick Exhaust Port		UHMW
9	98003047	2	Quick Exhaust Seal		Viton
10	98002243	4	Leak/Remote Exhaust Port Plug		PE
11	L0208	2	Pilot Cap		PP
12	W0116	2	Pilot Cap Seal		PTFE
13	W0123	2	Pilot Valve Assembly		
13A	W0122-01	2	Pilot Piston		PEEK
13B	98002302	2	O-ring		Viton
13C	W0099	2	Pilot Sleeve		PPS
13D	98002987	2	Pilot Button	1	PTFE
14	W0117	2	Pilot Valve Seal		PTFE
15	AW098	1	Master Head		PP
16	AW105	2	Diaphragm	2	PTFE
17	98003722	2	Screw		PTFE
18	AW071	2	Push Plate		PTFE
19	AW072	1	Shaft	2	PFA
20	98003322	2	Shaft Seal	2	PTFE
21	AW001	1	Body		PTFE
22	98003395	4	Transfer Tube Fitting		PP
23	98001072	2	3/8" Tube		PFA
24	AM060	2	Suction Sleeve		PTFE
25	98002334	4	O-ring	2	PTFE
26	98001415	4	Check Ball	2	PTFE
27	AM061	2	Discharge Sleeve		PTFE
28	AM083	2	Check Cap Seal	2	PTFE
29	AW003	2	Check Cap		PTFE
30	AW014	1	Damper Port Cap		PTFE
31	AW017	1	Damper Port Seal		PTFE
32	AW099	1	Slave Head		PP
33	AW057	1	Quick Release Base		PP
34	98003207	4	Screw		PP
35	98003071	1	Screw		PP
36	AM023	1	Lever Lock		PP
37	C0102	1	Base		PP

## 4.6 CLEAN-UP

To help remove potentially dangerous chemicals prior to service or shipment, the pump should be flushed with DI water or disassembled and thoroughly cleaned. Allow DI water to flush through the inlet and out the outlet to prevent pressure build up.

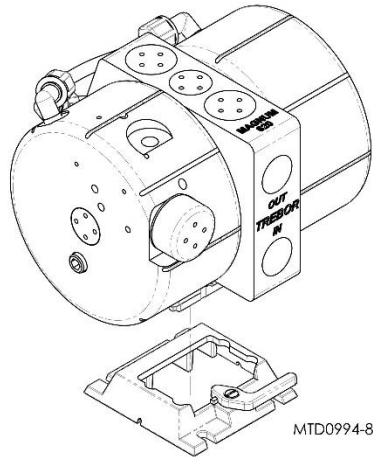


**CAUTION:** When handling pump, wear appropriate personal protection gear, including safety glasses.

## 4.7 DISASSEMBLY

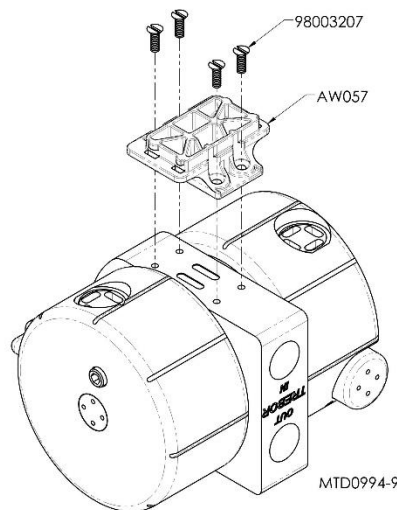
During the life of the pump it will be necessary to perform certain preventive maintenance procedures to ensure its continued high performance. This section and the next (4.8, Assembly) are provided for the user's convenience in disassembly and re-assembly procedures.

- Immerse or flush the pump assembly using DI water and a neutralizing agent.
- Remove lever-lock base from bottom of pump.



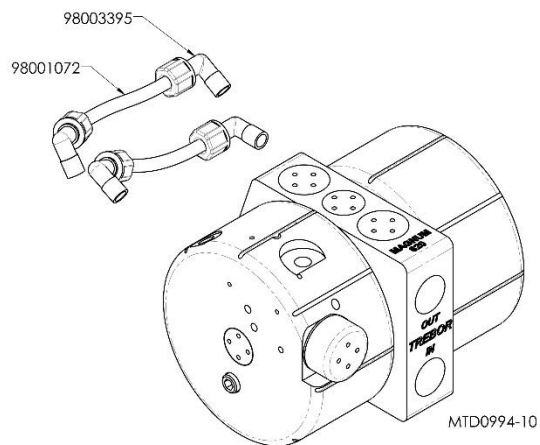
**Figure 4-2**

- Remove screws (98003207) and quick change base (AW057) from the bottom of the pump.



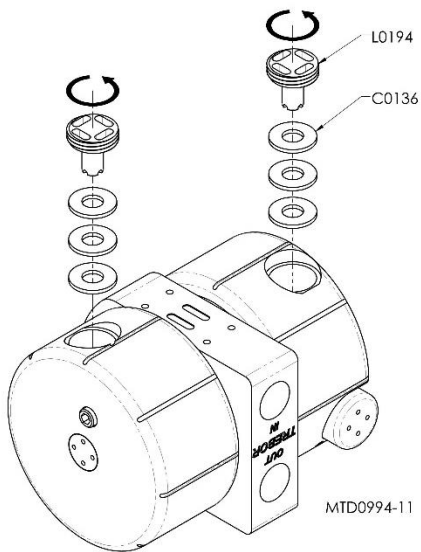
**Figure 4-3**

- Remove tube fittings (98003395) and tubing from the back of the pump.



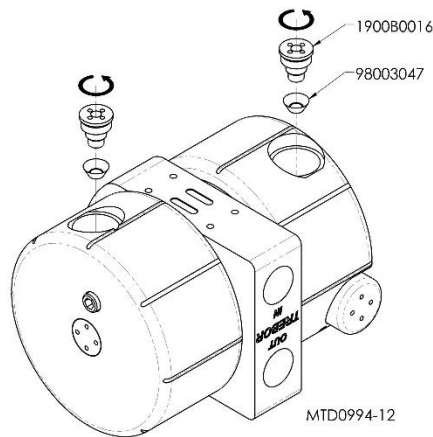
**Figure 4-4**

- Using 1" pin tool (T0147), remove the muffler spools (L0194) and muffler pads (C0136) from each head.



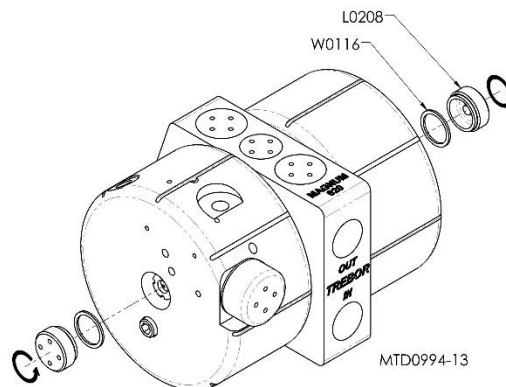
**Figure 4-5**

- Using  $\frac{1}{2}$ " pin tool (T0148), remove the quick exhaust ports (1900B0016) and quick exhaust seals (98003047) from each head.



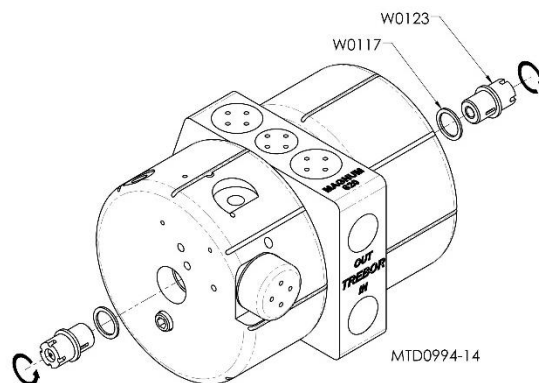
**Figure 4-6**

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the pilot caps (L0208) and pilot cap seals (W0116) from each head.



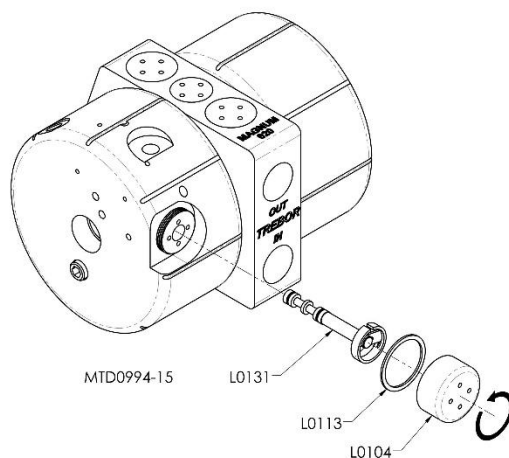
**Figure 4-7**

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the pilot valves (W0123) and pilot valve seals (W0117) from each head.



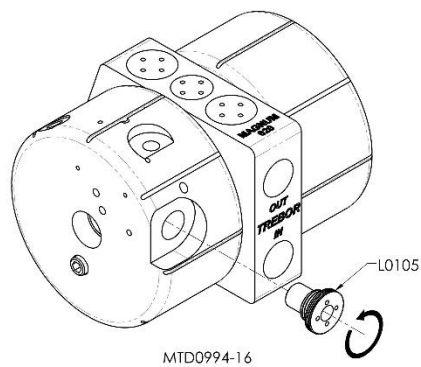
**Figure 4-8**

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the shuttle cap (L0104), the shuttle cap seal (L0113) and shuttle (L0131).



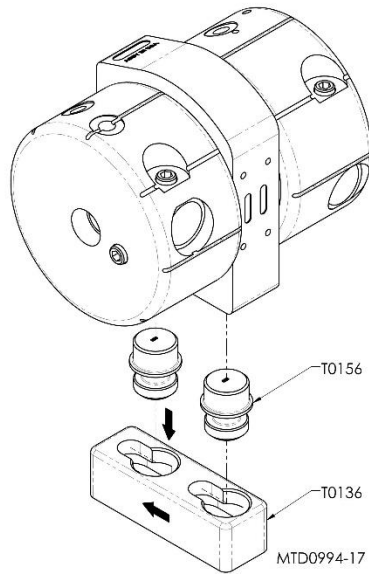
**Figure 4-9**

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the shuttle cap adapter (L0105).



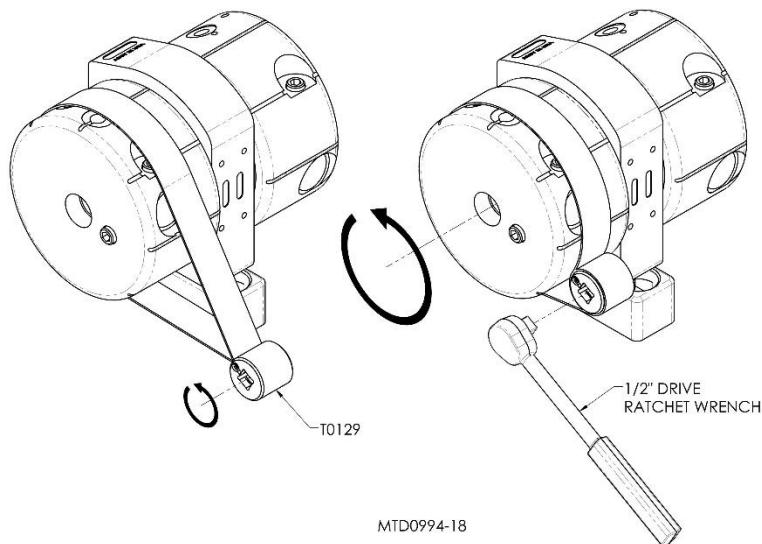
**Figure 4-10**

- Install mounting fittings (T0156) into pump fluid ports and lock body into bench mounting fixture (T0136). NOTE: Securely attach mounting fixture (T0136) to work surface using hardware provided.



**Figure 4-11**

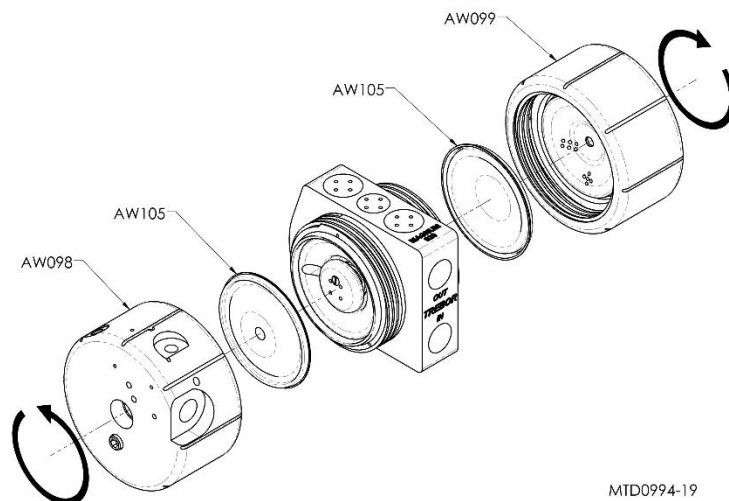
- Wrap the strap wrench around the head (AW099) as shown and with the aid of a 1/2" drive ratchet wrench, turn the head counter-clockwise to remove. Repeat process for other head (AW098).



**Figure 4-12**

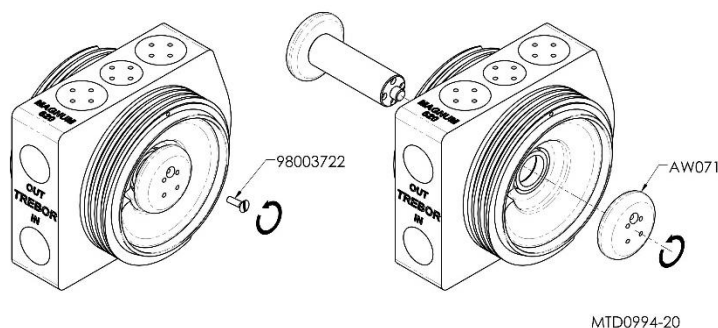


- Remove heads (AW098, AW099) and check diaphragms (AW105) for cracks or cuts.
- To remove diaphragms, slit diaphragm with a sharp knife and pull the diaphragms from the grooves. (Do not pry on diaphragm seal groove, as this will damage the sealing surface.)



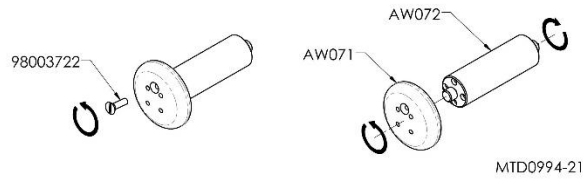
**Figure 4-13**

- Remove locking screw (98003722) from push plate (AW0741) using a slotted screwdriver.
- Using the  $\frac{3}{4}$ " pin tool (T0146), remove push plate (AW071) from shaft assembly. Then remove the shaft assembly from the pump.



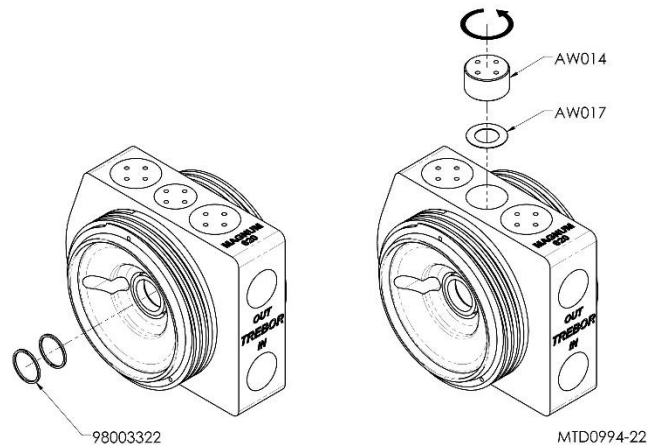
**Figure 4-14**

- Remove locking screw (98003722) from push plate (AW0741) using a slotted screwdriver.
- Using the  $\frac{3}{4}$ " pin tool (T0146), remove push plate (AW071) from shaft (AW072).



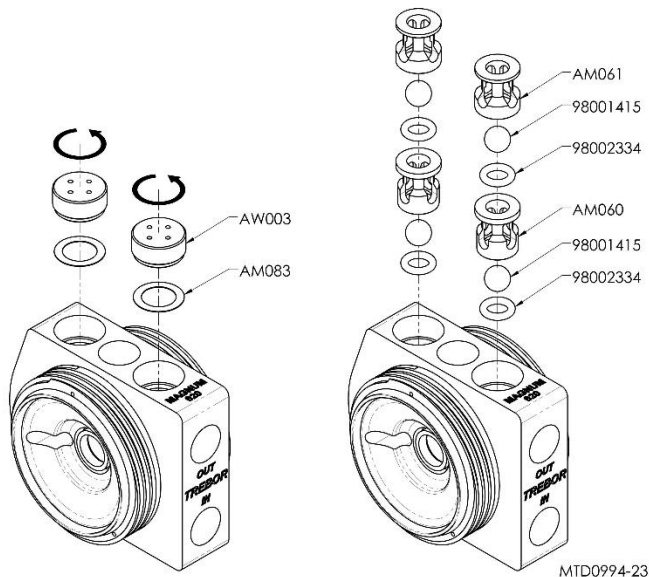
**Figure 4-15**

- Remove shaft seals (98003322) from the shaft bore.
- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the damper port cap (AW014) and seal (AW017).



**Figure 4-16**

- Using the  $\frac{3}{4}$ " pin tool (T0146), remove the check bore caps (AW003) and seals (AW003).
- Using the check sleeve removal tool (T000B0014) remove the check valve components from each check bore.



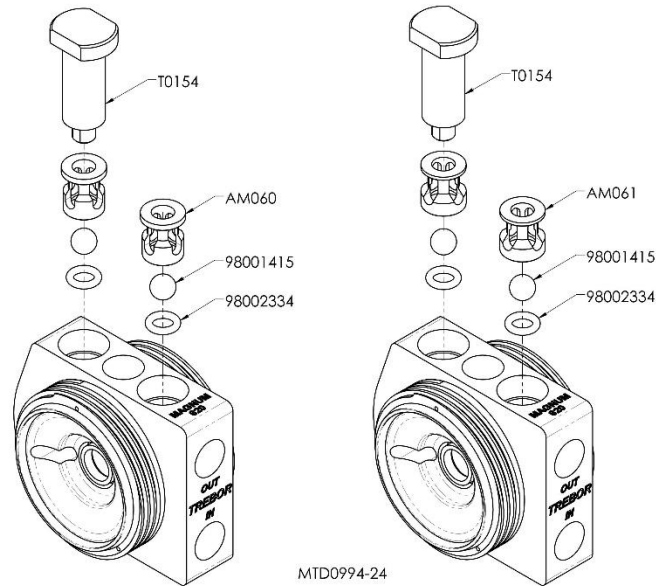
**Figure 4-17**

- Gently spray clean with DI water, or rinse by dunking all components in DI water, to remove any trace materials remaining after disassembly.

## 4.8 ASSEMBLY

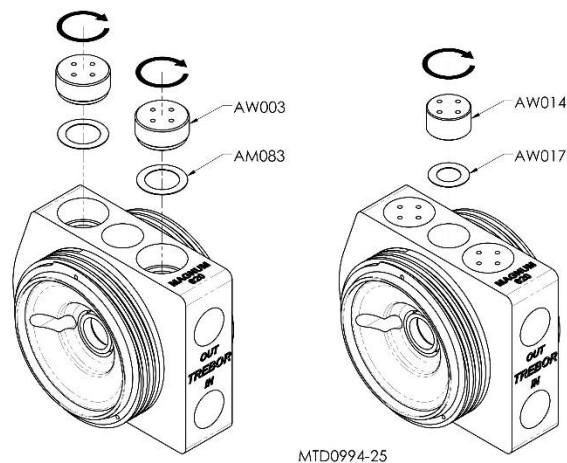
Prior to beginning assembly, inspect all parts to ensure they are clean and dry. Wear clean protective gloves. Precautions should be exercised to prevent contaminating any of the air chamber surfaces with chemicals during handling.

- Install O-rings (98002334), balls (98001415), and suction valve sleeve (AM060) into each bore using the check valve insertion tool (T0154).
- Install O-rings (98002334), balls (98001415), and discharge valve sleeve (AM061) into each bore using the check valve insertion tool (T0154).



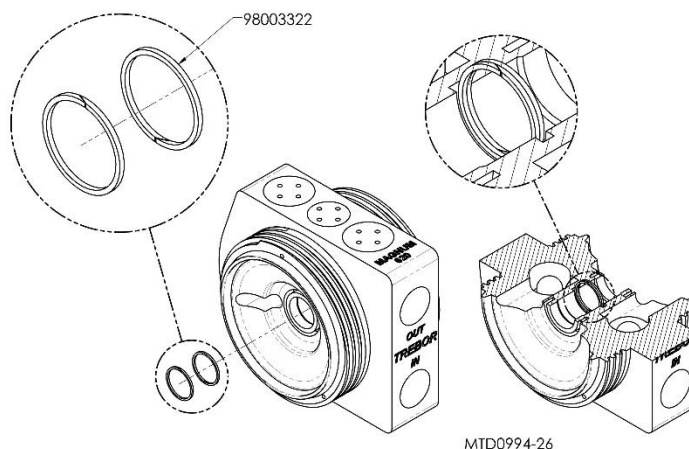
**Figure 4-18**

- Using the  $\frac{3}{4}$ " pin tool (T0146), install new check bore seals (AM083) and check bore caps (AW003). Torque to 60 in-lbs.
- Using the  $\frac{3}{4}$ " pin tool (T0146), install new damper port seal (AW017) and damper port cap (AW014). Torque to 45 in-lbs.



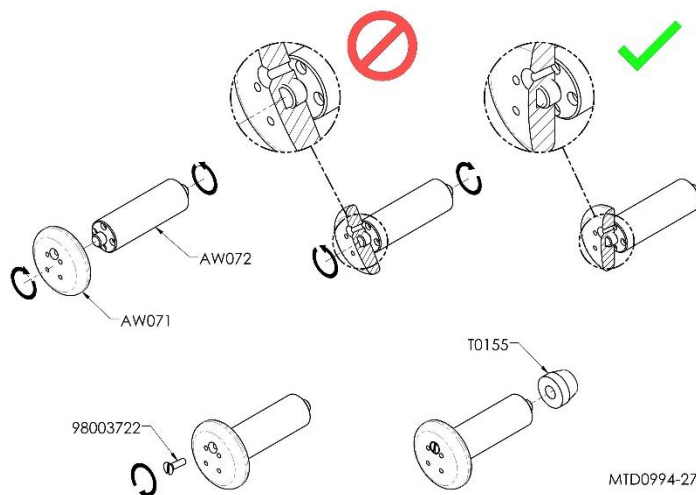
**Figure 4-19**

- Install shaft seals (98003322) into the shaft bore groove with slits oriented 180° apart.



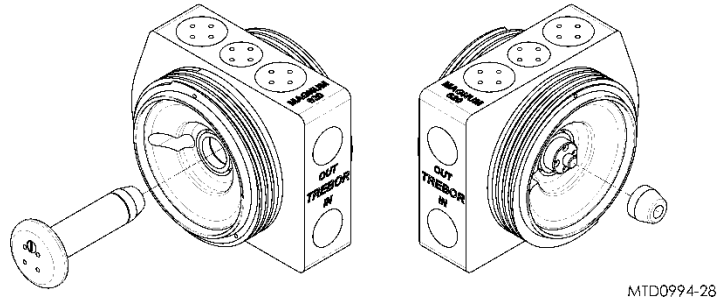
**Figure 4-20**

- Thread push plate (AW071) onto shaft (AW072) until the plate contacts the shaft shoulder. Continue tightening until the locking screw hole of the plate aligns with the next available hole in the shaft.
- Install the thread locking screw with a slotted screwdriver.
- Install the shaft bullet (T0155) onto opposite end of shaft.



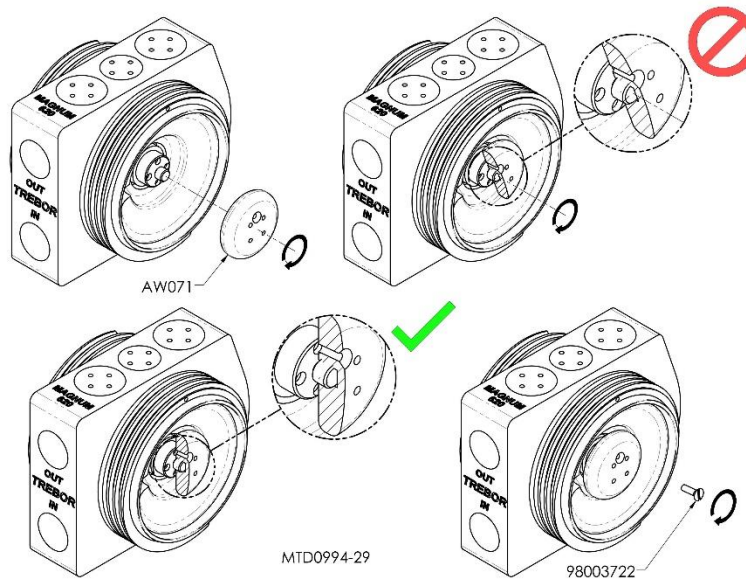
**Figure 4-21**

- Insert shaft into shaft bore. Remove shaft bullet from end of shaft.



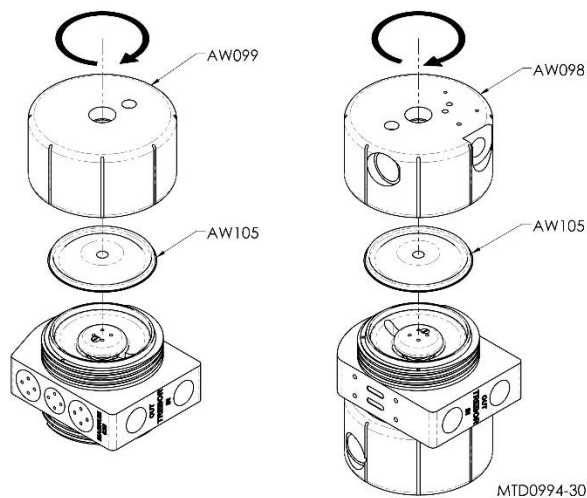
**Figure 4-22**

- Thread push plate (AW071) onto shaft (AW072) until the plate contacts the shaft shoulder. Continue tightening until the locking screw hole of the plate aligns with the next available hole in the shaft.
- Install the thread locking screw with a slotted screwdriver.



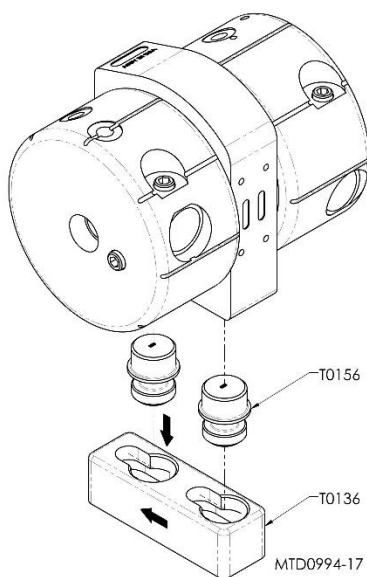
**Figure 4-23**

- Install diaphragm (AW105) and slave head (AW099) onto pump as shown. Thread hand tight.
- Install diaphragm (AW105) and master head (AW098) onto pump as shown. Thread hand tight.



**Figure 4-24**

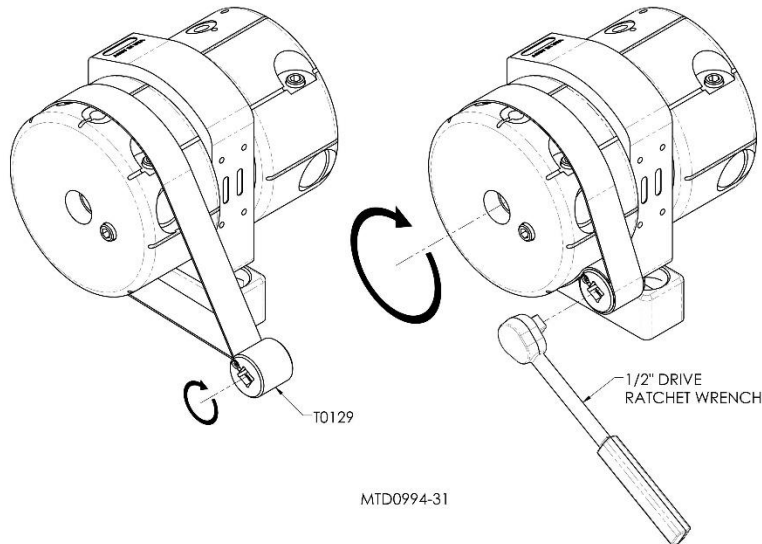
- Install mounting fittings (T0156) into pump fluid ports and lock body into bench mounting fixture (T0136). NOTE: Securely attach mounting fixture (T0136) to work surface using hardware provided.



**Figure 4-25**

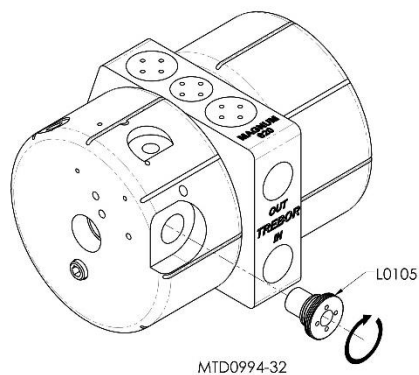


- Wrap the strap wrench (T0129) around the head (AW099) as shown and with the aid of a 1/2" drive ratchet wrench, turn the head clockwise to tighten until the exhaust ports face the bottom of the pump. Repeat process for other head (AW098).



**Figure 4-26**

- Using the 3/4" pin tool (T0146), install shuttle cap adapter (L0105). Torque to 45 in-lbs.

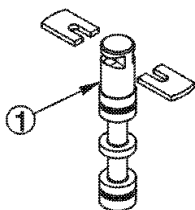
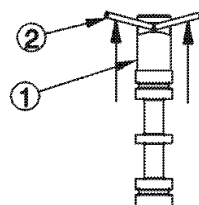
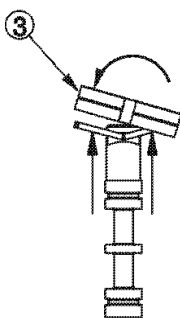
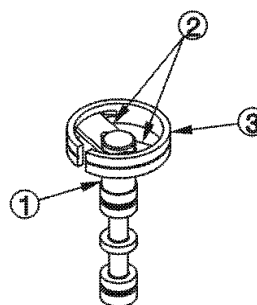


**Figure 4-27**

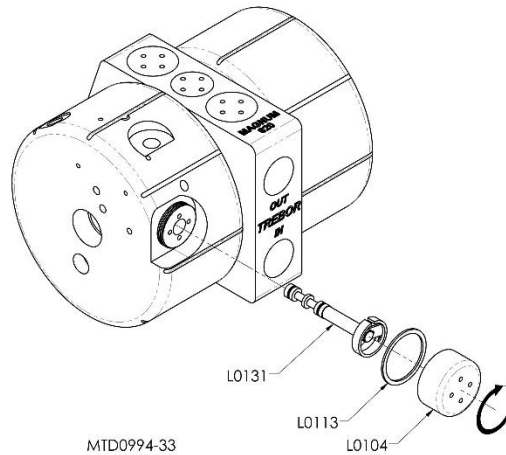


**Shuttle (L0131) assembly instructions:**

- Hold shuttle spool (item 1) upright and align slot 1 in detent legs (item 2) with notch on shuttle spool, see Fig. 1.
- Apply pressure upward onto base of detent legs with thumb and index finger, as shown in Fig. 2.
- Tilt the detent ring (item 3) over one of the legs, and align the groove on the inside of the detent ring with the end of the detent leg. Tilt the other side of the ring down, expanding it slightly, so that the other detent leg snaps into the detent ring groove. See Fig. 3. The completed assembly should look like Fig. 4.

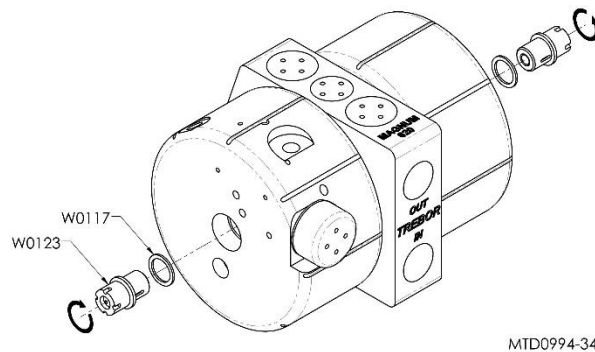
**FIG. 1****FIG. 2****FIG. 3****FIG. 4****MTD0312****Figure 4-28**

- Insert shuttle (L0131) into shuttle bore. Install seal (L0113) and thread shuttle cap (L0104) onto shuttle cap adapter (L0105). Using the  $\frac{3}{4}$ " pin tool (T0146), torque shuttle cap (L0104) to 40 IN-LBS.



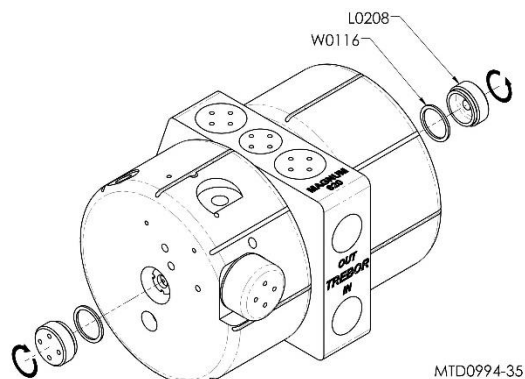
**Figure 4-29**

- Using the  $\frac{3}{4}$ " pin tool (T0146), install the pilot valves (W0123) and pilot valve seals (W0117) into each head. Torque the pilot valves (W0123) to 25 in-lbs.



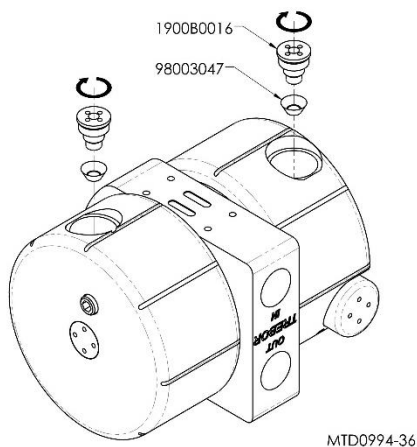
**Figure 4-30**

- Using the  $\frac{3}{4}$ " pin tool (T0146), install the pilot cap seals (W0116) and pilot caps (L0208) into each head. Torque the pilot caps (L0208) to 45 in-lbs.



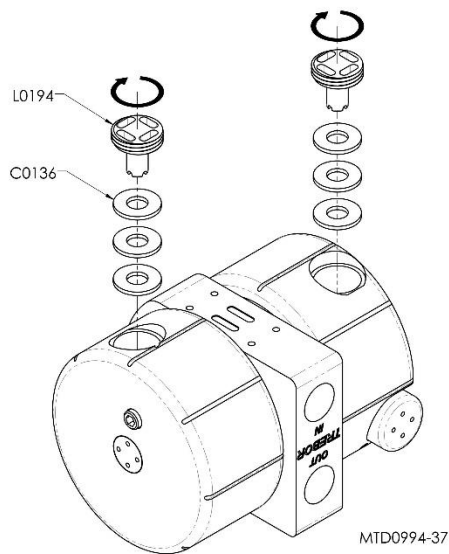
**Figure 4-31**

- Using the ½" pin tool (T0148), install quick exhaust seals (98003047) and quick exhaust ports (1900B0016) into each head. Torque the quick exhaust ports (1900B0016) to 15 in-lbs.



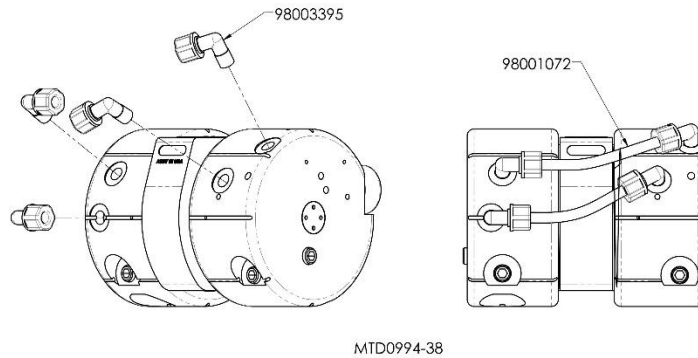
**Figure 4-32**

- Using the 1" pin tool (T0147), install the muffler pads (C0136) and muffler spool (L0194) into each head. Torque the muffler spools (L0194) to 40 in-lbs.



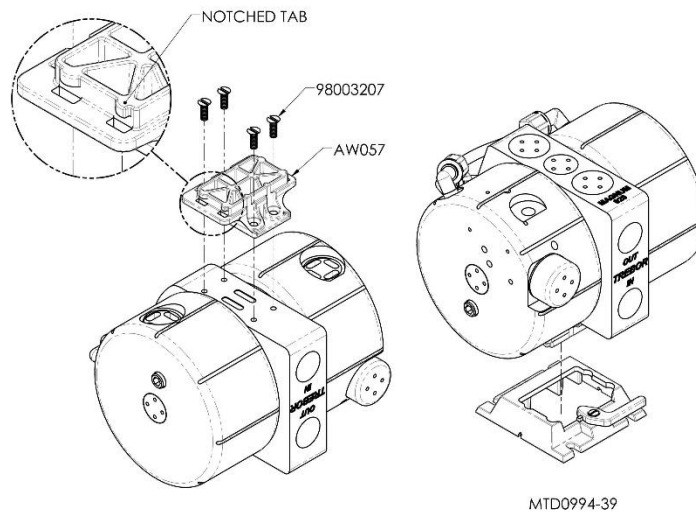
**Figure 4-33**

- Apply 2 wraps of 1/4" Teflon tape to the pipe threads of the tube fittings (98003395). Thread the fittings into the heads 4 to 4-1/2 turns until tube ports are facing each other across the pump body.
- Install transfer tubes (98001072) into the tube fittings (98003395) as shown.



**Figure 4-34**

- Install quick change base (AW057) with notched tab facing the front of the pump and screws (98003207) onto the bottom of the pump body with a slotted screwdriver.
- Attach quick change base (AW057) to lever lock base



**Figure 4-35**

## **4.9 TESTING**

### Performance Test

- With the air supply at 0 psi open the air supply valve
- Increase the air pressure until the pump starts to cycle
- Record the start pressure, Target = less than 20psig
- Pump must prime and even cycling must be achieved
- Increase pressure to 60 psi and allow pump to run for 5 minutes
- Check for fluid leaks, listen for air leaks, and check for irregularity
- Prepare the pump for drying

### Dry Pump

- Connect vacuum hose to discharge line
- Connect purge line to fluid inlet
- 60 psig Supply Pressure
- Cycle pump & vacuum dry by rotating pump side to side for 30 seconds.
- Turn off Air Supply and allow the pump to purge for 5 minutes.

### Dry Suction

- 40 psig Supply Pressure Target
- Record Suction Value
- Target = >8 in-Hg.

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## 5 TROUBLESHOOTING

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### Pump Will Not Start, Fails to Operate

Cause:

- Insufficient air pressure.
- Insufficient air volume (low supply pressure during running).
- Fluid discharge line blocked. Downstream valve closed, filter plugged or other obstruction.
- Pilot valve failure.
- Detent failure.

Solution:

- Must be minimum 28 psig at pump air hook-up.
- See Performance Charts (3.1) for requirements. Check for both regulator and control valve Cvs >.85 capabilities.
- Remove obstruction.
- Inspect and replace pilot valve body and poppet.
- Inspect detent legs for worn or damaged parts.

### Bubbles in Fluid Discharge

Cause:

- Leaking fluid inlet fitting.
- Leaking main seal.
- Pump inlet line pressure reached saturation point (due to high suction requirement).
- Ruptured (perforated) diaphragm.
- Check bore caps leaking.

Solution:

- Tighten fittings or replace adapter seal.
- Tighten heads an additional 15°. Replace diaphragms, and check head and body grooves for nicks or scratches.
- Increase diameter of suction supply line (reduces restriction). Reduce output flow.
- Replace diaphragms.
- Tighten check bore caps or replace seals.

### Fluid Leaks

Cause:

- Head torque not enough to affect seal.
- Leaking main seal.
- Check bore cap.
- Ruptured diaphragm(s) can result in fluid leaks through air exhaust port and shuttle valve.

Solution:

- Remove heads and allow them to sit for 1 hour. Reassemble with new diaphragms.
- Replace diaphragms. Check head and body seal grooves for nicks and scratches.
- Tighten, or remove and replace seal.
- Replace diaphragms and any parts that may have been damaged by fluid exposure.

### Erratic Cycling

Cause:

- Pilot valve failure.
- Suction line restricted (cavitation).
- Detent failure.
- Check ball(s) not seating.
- Over pressurization of pump discharge.

Solution:

- Inspect and replace pilot valve body and pilot.
- Reduce fluid restriction
- Inspect and replace spool assembly.
- Check O-rings for damage; replace if necessary. Make sure check balls move freely in sleeves.
- Reduce discharge pressure by reducing restriction.

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## 6 WARRANTY

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### **MAGNUM 620 PUMP**

TREBOR International, Inc. warrants to the purchaser of new equipment manufactured by TREBOR to be free from defects in material and workmanship when used for its intended purpose under normal operating conditions, and maintained according to the Operation/Maintenance Manual.

TREBOR's obligation under this warranty is limited to repairing or replacing, at TREBOR's option and at the TREBOR factory, any part or parts thereof which shall, within 1 year after delivery thereof to the original purchaser, be demonstrated to TREBOR's satisfaction to have been defective. This warranty may be transferred to subsequent owners. The warranty period is based on the original ship date from the factory. All warranty related freight costs shall be borne by the customer.

Excessive wear to pump components caused by pumping abrasive solutions or chemicals, as well as damage caused by ingesting foreign objects shall not be covered by this warranty.

This warranty shall not apply to any equipment which, in the judgment of TREBOR, shall have been repaired or altered outside TREBOR's factory in any way, so as to affect its performance or reliability; subjected to misuse, negligence or accident; or used other than in accordance with TREBOR's printed instructions.

<p><b>There are no terms, conditions or warranties, expressed, implied or statutory, of merchantability, fitness, capacity, or otherwise, of the goods ordered, other than, or different from, the warranty set forth above. This warranty takes precedence over any other warranty, expressed or implied.</b></p>
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TREBOR neither assumes, nor authorizes any other party to assume for it, any liability in connection with said equipment except as set forth above.

## 7 CONTACT INFORMATION

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### 7.1 GENERAL CONTACT INFORMATION

Web: [www.treborintl.com](http://www.treborintl.com)  
Phone Number: (801) 561-0303  
Toll Free Number: (800) 669-1303  
Fax Number: (801) 565-1510  
Email: [treborinfo@idexcorp.com](mailto:treborinfo@idexcorp.com)  
[treborsales@idexcorp.com](mailto:treborsales@idexcorp.com)  
Address: Trebor International  
8100 South 1300 West  
West Jordan, Utah 84088 U.S.A.

### 7.2 TECHNICAL SUPPORT

Email: [treborservice@idexcorp.com](mailto:treborservice@idexcorp.com)  
Phone Number: (801) 561-0303

### 7.3 REGIONAL REPRESENTATIVES

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