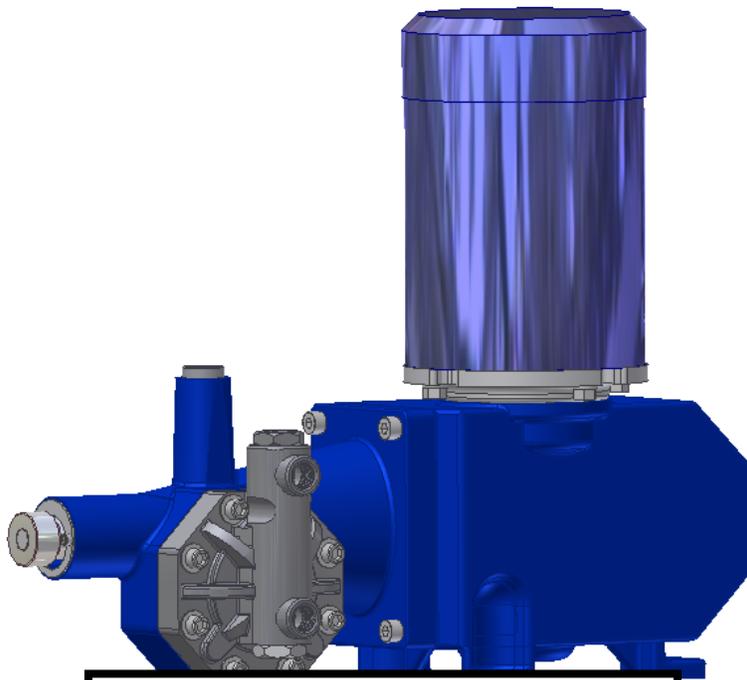


OPERATING &
INSTRUCTION
MANUAL
for
NEPTUNE
SERIES 6000 “dia-PUMP”
MODELS 6100 thru 6250



**204, Dekalb Pike,
Lansdale, PA 19446**

Lansdale, PA. 19446 • Tel.: 215-699-8700 • FAX: 215-699-0370

WARNING

LOCKOUTS ARE REQUIRED BEFORE
SERVICING THIS EQUIPMENT.

SAFETY INSTRUCTIONS:

Shut off/Lockout pump Power before Servicing.
Be certain pump isolation valves are
Closed and chemical is shut off.
Bleed pressure before servicing.

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SECTION I GENERAL DESCRIPTION

The Neptune Series 6000 "dia-PUMP" is a reliable metering pump of the high-pressure diaphragm type. Under constant conditions of temperature, pressure, and capacity adjustment settings, a +/- 1% metered discharge volume is maintained.

A plunger reciprocating at a fixed stroke displaces hydraulic fluid, which actuates a flexible, chemically inert, Teflon diaphragm to create pumping action. The capacity of the pump is regulated by controlling the volume of hydraulic fluid, which bypasses the diaphragm cavity.

Metering accuracy is maintained by a control rod, which allows hydraulic fluid replacement and air venting automatically with each stroke, while also taking into account temperature changes of the hydraulic fluid. Metering accuracy is also insured by the use of double ball check valves on the suction and discharge of the pump.

PLEASE READ THE INSTRUCTION MANUAL COMPLETELY BEFORE INSTALLING THE PUMP

**SECTION I
NEPTUNE CHEMICAL PUMP COMPANY
LIMITED WARRANTY**

All Neptune Pumps are tested at the factory prior to shipment. Each part used in their construction has been carefully checked for workmanship.

If the pump is installed properly, Neptune Chemical Pump Company, Inc. warrants to the purchaser of this product for a period of twelve months from the date of first use or eighteen months from shipment, whichever occurs first, this product shall be free of defects in material and/or workmanship, as follows:

1. Neptune Chemical Pump Company, Inc. will replace, at no charge, any part that fails due to a defect in material and/or workmanship during the warranty period, FOB our factory, Lansdale, Pennsylvania. To obtain warranty service, you must forward the defective parts to the factory for examination, freight pre-paid.¹
2. This warranty period does not cover any product or product part, which has been subject to accident, misuse, abuse or negligence. Neptune Chemical Pump Company, Inc. shall only be liable under this warranty if the product is used in the manner intended by the manufacturer as specified in the written instructions furnished with this product.

Any express warranty not provided in this warranty document, and any remedy for breach of contract that, but for this provision, might arise by implication or operation of law, is hereby excluded and disclaimed. Under no circumstances shall Neptune Chemical Pump Company, Inc. be liable to purchaser or any other person for any charge for labor, repairs, or parts, performed or furnished by others, nor for any incidental consequential damages, whether arising out of breach of warranty, express or implied, a breach of contract or otherwise. Except to the extent prohibited by applicable law, any implied warranty of merchantability and fitness for a particular purpose are expressly limited in duration to the duration of this limited warranty.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long any implied warranty lasts, so the above limitations may not apply to you. This warranty gives you specific legal rights, and you may have other rights, which may vary from state to state.

IMPORTANT

SHOULD IT BE NECESSARY TO SEND THE PUMP TO THE FACTORY FOR REPAIR OR MAINTENANCE REBUILDING; DRAIN ALL OIL AND CHEMICAL FROM PUMP BEFORE SHIPPING. FAILURE TO DO SO CAN CAUSE EXTENSIVE DAMAGE TO THE MOTOR.

SEE IMPORTANT NOTICE - RETURN GOODS AUTHORIZATION

**IMPORTANT NOTICE
RETURN GOODS AUTHORIZATION**

- (1) All equipment returned to Neptune Chemical Pump Company, Inc. requires proper Returned Goods Authorization Number (RGA) and tags.
- (2) All equipment returned to the factory for repair or service must first be thoroughly flushed and have all chemical contact areas neutralized.
- (3) All equipment which has been in contact with chemicals must be accompanied by a copy of the Chemical Product Material Safety Data Sheet (MSDS).
- (4) Failure to comply with the above instructions will result in equipment being returned to sender, freight collect, without service.

SECTION I

PARTS ORDERING INSTRUCTIONS

The complete model number and serial number of the pump must be furnished to insure prompt and accurate parts service. These numbers are found on the name plate (sample below) located on the side of the pump. Refer to **Section VI** for complete parts lists.

NEPTUNE PROPORTIONING PUMP					
MODEL NO.	XXXXXX				
SERIAL NO.	XXXXXX				
MAX. CAP. EACH CYL.	XXX	GPH	MAX. PRESSURE	XXX	PSI
NEPTUNE CHEMICAL PUMP CO., INC.					
LANSDALE, PA 19446					
PHONE (215) 699-8700					

Send all orders or inquiries for parts to:

Parts Department
Neptune Chemical Pump Company, Inc.
P.O. Box 247
Lansdale, PA 19446
Tel.: 215-699-8700
1 -888-3NEPTUNE (888-363-7886)
FAX: 215-699-0370

NOTE: PLEASE SUPPLY BOTH MODEL AND SERIAL NUMBERS.

SECTION II

INSTALLATION INSTRUCTIONS

1.0 GENERAL (REFER TO PARTS DRAWING ON PAGE#16)

1.0.1 UNPACKING & INSPECTION

When unpacking a pump or chemical feed system, be certain that no parts are thrown away. Examine the equipment for possible damage. If damage has occurred, file claim with the common carrier within 24 hours. Neptune will assist in estimating the repair costs.

1.0.2 The "dia-Pump" should be located on a level surface. Three mounting holes are provided to anchor the pump securely to the mounting surface. All piping to the pump should be supported to prevent stress on the pump input and output fittings.

1.0.3 Before connecting the pump make sure that all fittings are completely clean by flushing thoroughly. Any foreign matter entering the pump can damage the internal parts and severely limit the life of the pump.

1.0.4 A "Y" STRAINER (AT LEAST ONE PIPE SIZE LARGER THAN SUCTION INLET SIZE OF THE PUMP) MUST BE INSTALLED IN THE SUCTION LINE OF THE PUMP TO INSURE AGAINST FOREIGN MATTER ENTERING THE PUMP

1.0.5 It is recommended that shut-off valves and unions be placed in the suction and discharge lines if possible. Such an arrangement will facilitate servicing the pump.

1.0.6 The electrical supply to the pump must match the motor nameplate characteristics. The motor rotation is counter clockwise when viewed from the top of the motor or looking down on the pump. An arrow mark on the gearbox shows the rotation (See Figure 1)

IMPORTANT

On single-phase units, the rotation is set at the factory and must not be changed.

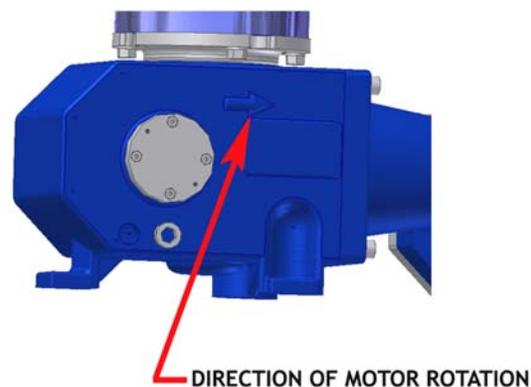


FIGURE 1

Please note Figure 1, indicating the correct rotation. Operation with the incorrect rotation will damage the pump and motor.

1.0.7 Please note, that some items in the parts list have more than one part number for an individual figure number. These different part numbers insure unique identification of parts, which are available in more than one material of construction, or as in the case of gears, pistons etc, more than one speed, sizes. Please use the part number, not the figure number when ordering.

- 1.0.8 Fill gearbox and pump by pouring the hydraulic fluid (drive lubricant) supplied through the fill opening at the rear of the pump. Pour fluid in slowly until it covers the worm gear. The control knob should be in the zero position during the filling.

PLEASE NOTE: TO VENT THE AIR, REMOVE VENT PLUG LOCATED ON TOP OF THE OIL HEAD (# 54 on Parts Drawing).

Allow 30 minutes for hydraulic fluid to make its way into pump chamber and then recheck fluid level.

The hydraulic fluid supplied by Neptune is EP SAE 90.

Common sources for hydraulic fluid are:

Shell Oil	Omala #220
Mobil Oil	Mobil Gear #629
Sun Oil	Sun Oil #220
Texaco	Meropa #220

2.0 SUCTION PIPING

- 2.0.1 The suction piping to the pump must be absolutely airtight and one size larger than suction inlet size of the pump. It is suggested that the suction piping be tested with low air pressure and a soap solution to assure that no leaks exist. Limit the total length of the suction line to 3-4 feet for suction lift or 6-7 feet for flooded suction. Minimize bends, elbows, or other restrictions.
- 2.0.2 NEPTUNE RECOMMENDS THAT THE “dia-PUMP” BE OPERATED WITH A FLOODED SUCTION, AS THIS WILL FACILITATE START UP AND INCREASE THE SERVICE LIFE OF THE PUMP.
- 2.0.3 It is highly recommended that all solution tanks be furnished with a low level cut off switch or low-level alarm and cut off switch to prevent the pump from running dry. OPERATION AGAINST A DRY SYSTEM WILL CAUSE DAMAGE TO THE PUMP DIAPHRAGM AND REDUCE THE OPERATING LIFE OF THE PUMP.

3.0 DISCHARGE PIPING

- 3.0.1 It is recommended that the “dia-Pump” operate against a minimum discharge pressure of 50 psig.
- 3.0.2 All Neptune Series 6000 “dia-Pumps” are supplied with an internally pre-set relief valve. This relief valve is set above the actual rated discharge pressure of the pump and is designed to protect the pump should a discharge pressure’ beyond the rated limit of the pump occur.
- 3.0.3 To protect the piping system, it is recommended that an external relief valve as manufactured by Neptune Chemical Pump Company, or equal, be placed in the discharge line of the pump.
- 3.0.4 Discharge piping should equal discharge port size.

4.0 ADJUSTMENT OF INTERNAL RELIEF VALVE

- 4.0.1 All Neptune Series 6000 “dia-Pumps” are supplied with an internally pre-set relief valve. The internal relief valve is set as follows:

Model	APROXIMATE INTERNAL RELIEF VALVE SETTING (PSI)				
	1/2 HP	3/4 H/P	1 H/P	1-1/2 HP	2 HP
6100	1500	2500	3000	4000	4500
6150	1500	2500	3000	3500	4000
6250	600	1200	2000	2300	2500

- 4.0.2 The internal relief valve is designed to protect the pump itself should a discharge pressure beyond the relief valve setting occur.
- 4.0.3 If a customer order specifies a relief valve setting above those indicated above, the specified setting will be set at the factory. All pumps are tagged with the relief valve setting used by the factory.
- 4.0.4 To protect the external piping system, it is recommended that a relief valve as manufactured by Neptune Chemical or equal be placed in the discharge line of the pump. It is further recommended that this relief valve be piped into return of the tank with clear PVC tubing so that it can be determined if the solution is bypassing through the valve and returning to the tank, indicating a line blockage.
- 4.0.5 Drawing on page16 illustrates the locations of the internal relief valve (#32, #33, #34, #35, #36, #37 on Parts Drawing).
- 4.0.6 The drawing shows a passage connecting the hydraulic fluid reservoir with the hydraulic fluid side of the diaphragm.
- 4.0.7 The passage is interrupted by the relief valve ball (FIG. #37 on Parts Drawing), which is backed up by a relief valve spring (#35 on Parts Drawing).
- 4.0.8 If, during the pump operation, the pressure on the hydraulic fluid side of the pump exceeds the set pressure of the internal relief valve, the ball is forced from its seat allowing the hydraulic fluid to flow back to the reservoir.
- 4.0.9 To reset the relief valve to a higher pressure (the relief valve setting cannot be reduced because of design considerations), instructions are as follows:
- 4.0.10 Connect a test set-up as shown in **Figure 2** (Page 10)
- NOTE:** All parts must have a working pressure rating above the required set pressure.
- 4.0.11 Start and run the pump until all air is relieved from the discharge liquid (hand valve open).
- 4.0.12 Remove relief valve cap (#32 on Parts Drawing).
- 4.0.13 Close hand valve; pressure gauge should read between 250 and 4500 psi depending on pump model.
- 4.0.14 Use 5/16" Allen wrench to adjust spring tension by turning relief valve adjusting screw (#34 on Parts Drawing).
- (1) To increase pressure, turn relief valve adjusting screw (#34 on Parts Drawing) in.
- (2) To decrease pressure, turn relief valve adjusting screw (#34 on Parts Drawing) out.
- 4.0.15 After resetting or adjusting pressure, replace relief valve cap (#32 on Parts Drawing).

CAUTION

Never turn relief valve adjusting screw (# 34 on Parts Drawing.) completely in.

Do not attempt to set the internal relief valve more than 25% in excess of nameplate rating.

Take out Relief Valve cap to access Relief Valve screw (#32 on Parts Drawing). Insert Hex wrench to adjust relief valve setting.



FIGURE 2

5.0 INSTALLATION OUTDOORS

The “dia-Pump” is a totally enclosed pump, which can be used outdoors or indoors. When installed outdoors, make sure that the pump is protected against extremes of nature as follows:

- 5.0.1 Running of the pump when exposed to tropical sunshine with ambient temperature above 90°F (32°C) would cause excessive oil and motor temperatures. The pump should be shaded and located in such a way as to permit an ample degree of air circulation.
- 5.0.2 Under cold conditions, the pump should be insulated and a heater should be supplied in order to maintain the hydraulic fluid at an ambient temperature above 30°F (—1°C.)

6.0 START UP PROCEDURE

The following start up procedure is complete and does repeat instructions on filling the gearbox and pump.

- 6.0.1 Remove backpressure spring, if any (anti-siphon spring, Part#100198 on Fig 3) for start up. Reinstall after pump is operational if needed.
- 6.0.2 Flooded Suction: Refer to Section II, Paragraph 1.0.9, for instructions on filling gearbox with hydraulic fluid.
- 6.0.6 On initial start-ups: Set the pump capacity at 0%.
Check for proper motor rotation (Refer to Paragraph 1.0.6).
- 6.0.3 Open air bleed port (#51 on the drawing). Let all the air escape from the oil side. Keep it open until only oil comes out from the port. Close the port tight. Run pump for 10-15 seconds couple of times and listen for any abnormal motor or crank noises, and if present, refer to trouble shooting chart.

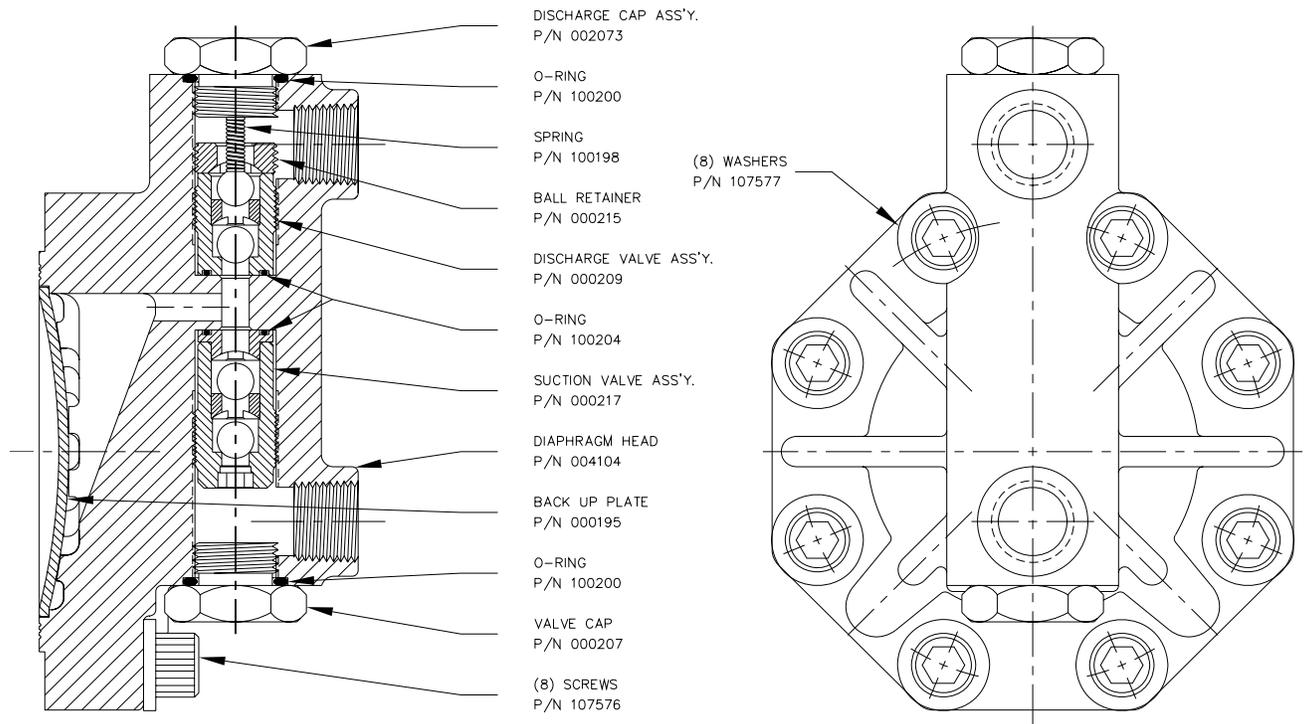


FIGURE 3

- 6.0.4 Make sure that the pumping chamber is flooded by loosening Discharge Cap (Part#002073 on Fig 3) and allowing solution to appear. Then tighten Discharge Cap (Part#002073 on Fig 3). This procedure will also allow air to vent from pumping chamber. THE "dia-PUMP" WILL NOT FUNCTION IF AIR IS TRAPPED IN THE HYDRAULIC FLUID OR LIQUID INSIDE OIL PUMP CHAMBER.
- 6.0.5 After having let pump stand for 30 minutes and having rechecked fluid level, set pump capacity indicator at approximately 30%. Be certain that pump suction and discharge lines are open.
- 6.0.5 Start pump. Slowly adjust to the required capacity.

WARNING

BEWARE APPLICATIONS WHERE WATER IS NOT COMPATIBLE WITH CHEMICAL TO BE PUMPED.
EXAMPLE: NEVER FORCE PRIME WHEN PUMPING ACID OR OIL BASED PRODUCTS.

SECTION III

NORMAL MAINTENANCE

7.0 MAINTENANCE

Under normal conditions, the “dia-Pump” should not require any significant amount of maintenance. It is advised that periodic visual observations be made of the oil level to make sure that it is over the worm gear. The liquid end of the pump should also be inspected for leakage. These observations should be made regularly.

The hydraulic fluid should be drained and replaced twice a year, using the drain plug (# 68 on Parts Drawing) at the back of the pump. This change can be scheduled with the normal factory maintenance at seasonal periods.

7.0.1 Check Valves: Removing, cleaning, replacing.

The “dia-Pump” incorporates a unique check valve design whereas the discharge and suction piping NEED NOT be disturbed in order to service the valves.

Should the valves need cleaning, remove as follows:

7.0.2 Remove discharge valve cap (# 002073 on Figure 3).

7.0.3 Remove ball retainer (# 000215 on Figure 3), using 5/16” Allen wrench.

7.0.4 Remove discharge valve cartridge (# 000209 on Figure 3). Using special wrench provided. Be certain that valve “O” ring (# 100204 on Figure 3) is removed with valve cartridge.

7.0.5 Remove suction valve cap ((# 000207 on Figure 3).

7.0.6 Remove suction valve cartridge (# 000217 on Figure 3), using 5/16” Allen wrench. Be certain that valve “O” ring (# 100204 on Figure 3) is removed with valve cartridge.

7.0.7 Clean valve cartridges with suitable solvent. The valve cartridge is a complete and integral unit and should not be disassembled for cleaning. If the valves are found to be worn and in need of replacement, an entire valve cartridge in either suction or discharge should be ordered. The suction valve is the longer of the two valve cartridges.

7.0.8 To replace reverse above procedure using a small amount of grease to hold valve “O” rings in place. Do not over tighten the valve cartridges as this could damage the valve “O” rings.

FOR THE FOLLOWING OPERATIONS REFER TO **PART DRAWING** ON PAGE 16

7.1.1 Procedure for replacing Control Rod “O” RING (#50,51 on Parts Drawing) and Sealing Plate “O” RING (#52 on Parts Drawing).

7.1.2 Remove hydraulic fluid from gearbox.

7.1.3 Remove indicator plate (#46 on Parts Drawing), by removing two indicator plate screws (#45 on Parts Drawing)

7.1.4 Remove control rod assembly with control rod attached for all pumps;(#42, 43, 44, 53 on Parts Drawing) by turning counter clockwise until threads are disengaged, then pulling out.

- 7.1.5 Remove sealing nut (#39 on Parts Drawing)
 - 7.1.6 Remove seal plate (#38 on Parts Drawing) using small brass hook to pry loose
 - 7.1.7 Replace control rod "O" ring (#50 on Parts Drawing) & BACKUP RINGS (#51 on Parts Drawing)
 - 7.1.8 When replacing sealing plate take care so as to not shear the sealing plate "O" ring and backup ring (#52 and #68 on Parts Drawing). Apply grease to "O" rings before assembly. Take special care to place the outside backup ring (#68 on Parts Drawing) in the right place when replacing the outside "O" ring and backup ring.
 - 7.1.10 Replace balance of parts and fill pump with hydraulic fluid per previous instructions.
 - 7.1.11 Follow startup procedure as if starting a new pump. Refer to Section II, Paragraph 1.0.9 and 6.0.
- 7.2.1 Removal of pump-head and replacement of diaphragm.
- 7.2.1 Remove drain plug (#67 on Parts Drawing), and drain hydraulic fluid.
 - 7.2.2 Remove pump head bolts and washers (#65 and #66 on Parts Drawing). Move pump head (#62 on Parts Drawing) away from pump.
 - 7.2.3 Remove and examine teflon diaphragm (#47 on Parts Drawing). Remove and examine the liquid side diaphragm backup plate (#64 on Parts Drawing). Replace with new backup plate and Diaphragm, if required. When replacing the Teflon diaphragm, be certain to line it up properly with the sealing grooves.
 - 7.2.4 To reassemble reverse the above procedure. Laying the pump on its side facilitates reassembly. Be certain to tighten all bolts evenly. Tighten to 65 ft. lbs.

SECTION IV

MOTOR OPERATING CONDITIONS

- 8.0 The normal temperature rise for standard motors is 40°C above ambient temperature and, thus, it might appear that the motor is operating at a higher than normal temperature. This situation is normal and should not cause concern.

As a precaution against motor overheating, it is recommended that the pump be located where adequate ventilation is available, It is also recommended that a MOTOR STARTER WITH THE PROPER OVERLOAD PROTECTION BE SUPPLIED AS AN ADDITIONAL SAFETY DEVICE.

SECTION V TROUBLE SHOOTING CHART

SYMPTOMS	CAUSES	REMEDIES
1. Pump Motor Will Not Operate.	A. Blown Fuse.	Check for short circuit or overload
	B. Open thermal overload device in starter.	Reset.
	C. Low liquid level in tank (where low level cut-off is used).	Fill tank.
	D. Broken wire.	Locate and repair.
	E. Low voltage.	Check for too light wiring.
	F. Oil "frozen" in pump.	Thaw out.
2. Pump Does Not Deliver Rated Capacity	A. Starved suction.	Replace suction piping with larger size.
	B. Leaky suction piping.	Pressure test, repair or replace defective piping.
	C. Excessive suction lift.	Rearrange equipment location to reduce suction lift.
	D. Liquid too close to boiling point.	Lower temperature or increase suction pressure slightly.
	Air or gas trapped in oil or chemical solution.	Decrease capacity to 20% for 7 mins. then increase to 100% for 7 mins. Bleed air from valve system
	F. Worn or dirty valves or seats, or both.	Clean or replace.
	G. Viscosity of liquid too high.	1. Reduce viscosity by heating or other means. 2. Increase size of suction piping 3. Increase suction pressure slightly
	H. Insoluble materials, crystallization or solids settling.	Limit solution strength to 5% by weight. Flush and clean solution tank periodically. Suction connection should be 2 to 4" from bottom of solution tank.
	I. Low discharge pressure.	A minimum discharge pressure of 50 psi is required to insure proper capacity control
3. Pump delivers erratically.	A. Leaky suction line.	Repair or replace piping.
	B. Worn or dirty valves or seats, or both.	Clean or replace valve assembly.
	C. Excessive excursion of ball valves from seats (indicated by ball chatter).	Increase backpressure.
	D. Insufficient suction pressure	Increase suction pressure.
	E. Liquid too close to boiling point,	Raise tank level. Reduce temperature or raise suction pressure.
	F. Leaky system relief valve.	Repair or replace relief valve
	G. Low hydraulic fluid level.	Add hydraulic fluid.
4. Motor overheats thermal overload activates,	A. Power supply does not match motor.	Check power supply against motor nameplate data.
	B. Overload caused by operating pump beyond rated capacity	Check operating pressure against pump manufacturer data plate maximum rating
5. Noisy Operation 1. In Pump	A. Pump Valves.	Valves must move to open and close, and they will make a clicking noise as they operate. These noises are sometimes amplified by natural resonances in piping system. They are usually indications of normal valve functioning.
	2. In Gear Reducer	Fluid compressibility causes reversal of load on gears at end of pressure stroke, Not considered detrimental.
6. Oil level overflows reservoir,	A. Flexible diaphragm punctured	Replace diaphragm and hydraulic fluid (drive lubricant) if contaminated.

SECTION VI

9.0.1 SPARE PARTS

9.0.2 Important—When ordering spare parts, please show MODEL NUMBER AND SERIAL NUMBER of pump for which parts are being ordered. This information can be found on a stainless steel nameplate riveted to the side of the pump.

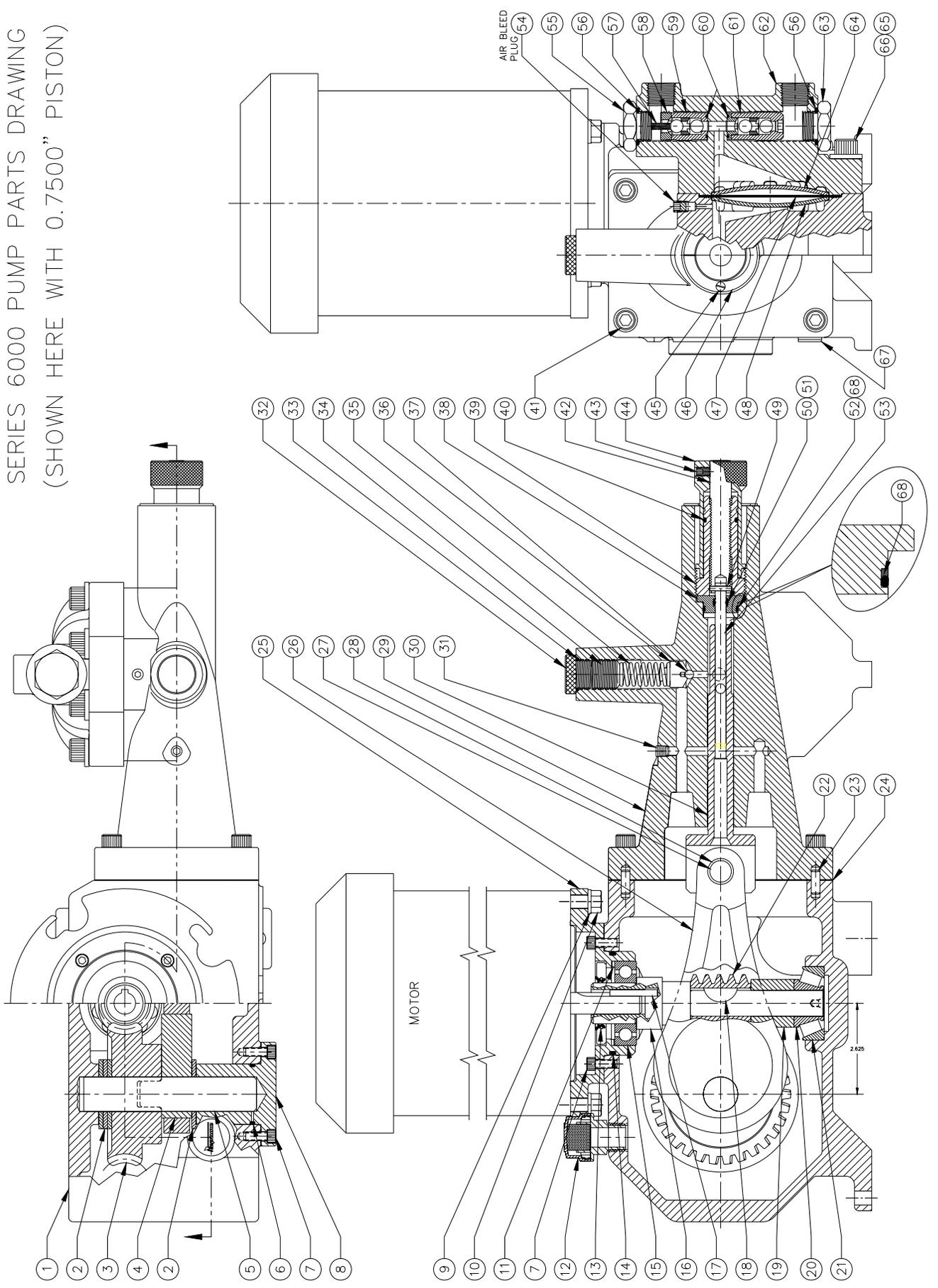
9.0.3 Recommended Spare Parts (Spare parts Kit Part#004353)
It is recommended that the following parts be kept in stock for a pump:

ITEM#	PART#	DESCRIPTION	QTY.
47	004108	Teflon Diaphragm	1
52	100082	Sealing Plate "O" Ring	2
50	100323	Control Rod "O" Ring	2
51	106547	Control Rod Backup Ring	4
60	100204	Valve "O" Ring	8
56	100200	Discharge & Suction Cap "O" Ring	4
59	000209	Discharge Valve Cartridge	1
61	000217	Suction Valve Cartridge	1
68	108019	Sealing Plate backup Ring	1

PARTS ORDERING INSTRUCTIONS

Note: For prompt entry of orders for this pump, your order must include both model number and serial number.

SERIES 6000 PUMP PARTS DRAWING
 (SHOWN HERE WITH 0.7500" PISTON)



**PARTS LIST FOR PUMP MODELS 6100 to 6250
(REFER TO PART DRAWING ON PAGE 16)**

ITEM#	DESCRIPTION	QTY.	PART#
1	Gear Box	1	004089
2	Thrust Washers	4	107595
3	Worm Gear 58 SPM	1	004098
	Worm Gear 117 SPM	1	004099
4	Eccentric	1	004100
5	Gear Shaft	1	107598
6	Shaft Retainer O-Ring	1	107580
7	Gear Shaft Retainer Screws	7	100211
8	Gear Shaft Retainer	1	004094
9	3/8" Lock Washers	4	100217
10	3/8-16 X 1" lg. screws	4	100216
11	Wave Spring	1	107599
12	Fill/Vent Plug	1	000191
13	Oil Seal	1	106586
14	Motor Adapter O-Ring	1	107600
15	Ball Bearing	1	106180
16	Worm Shaft 58 SPM	1	004096
	Worm Shaft 117 SPM	1	004103
17	Motor Coupling Key	1	106589
18	Woodruff Key	1	107601
19	Worm Shaft Bushing	1	107736
20	Bearing Cone	1	107596
21	Bearing Cup	1	107597
22	Worm 58 SPM	1	107592
	Worm 117 SPM	1	107593
23	Spring Pin	2	100010
24	Gasket	1	107581
25	Motor Adapter	1	004095
26	Connecting Rod	1	004091
27	Connecting Rod Pin	1	100304
28	Connecting Rod Sleeve	1	000359
29	Pump Body 3/4" Dia.	1	004109
	Pump Body 1" Dia.	1	004110

ITEM#	DESCRIPTION	QTY.	PART#
30	Piston 3/4" Dia.	1	004231
	Piston 1" Dia.	1	004232
31	1/8 NPT Pipe Plug	1	100196
32	Relief Valve Cap	1	000365
33	Relief Valve Cap O-Ring	1	100200
34	Relief Valve Adjusting Screw	1	000364
35	Relief Valve Spring	1	100310
36	Relief Valve Ball Guide	1	000379
37	1/4" Dia. Ball	1	100559
38	Sealing Plate 3/4" & 1" pistons	1	004111
39	Sealing Nut	1	004102
40	Knob Friction O-Ring	1	100327
41	Pump/Head Screws	4	105082
42	Control Rod Screw	1	004093
43	Control Knob Screw	1	100308
44	Control Knob	1	004092
45	Indicator Plate Screws	2	100190
46	Indicator Plate	1	000188
47	Teflon Diaphragm	1	004108
48	Oil Side Back-up Plate	1	000194
49	Control Rod Spring Pin	1	100063
50	Control Rod O-Ring	1	100323
51	Control Rod Parbak Rings	2	106547
52	Sealing Plate O-Ring	1	100082
53	Control Rod, for 3/4" or 1" Piston	1	000385
54	Air Bleed Plug	1	100210
56	Valve Cap O-Rings	2	100200
60	Valve Seat O-Rings	2	100204
65	Pump Head Screws	8	107576
66	Washers	8	107577
67	Drain Plug	1	100300
68	Sealing Plate backup Ring	1	108019

PARTS FOR PUMPS WITH METAL HEADS

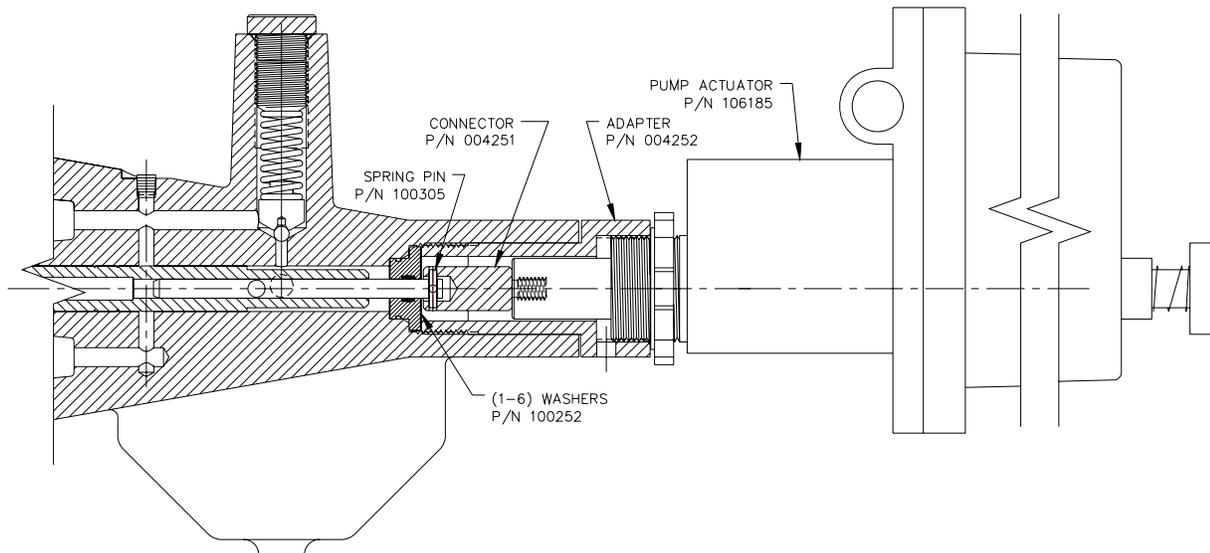
ITEM#	DESCRIPTION	QTY.	SST - PART NO.	C20 - PART NO.
55	Discharge Valve Cap	1	002073	002072
57	Anti-Siphon Spring	1	100198	100199
58	Discharge Valve Nut	1	000215	000216
59	Discharge Cartridge	1	000209	000210
61	Suction Valve Cartridge	1	000217	000218
62	Liquid Head	1	004104	004106
63	Suction Valve Cap	1	000207	000208
64	Diaphragm Back Up Plate, Liquid Side	1	000195	000196

SECTION VII

SPECIAL INSTRUCTIONS FOR SERIES 6000 “dia-PUMPS” WITH ELECTRONIC STROKE CONTROL MODEL #SM-1020

Neptune Electronic Stroke Control Unit adjusts the capacity of the 6000 Series Pump over its full operating range by changing the stroke length in response to an external signal. Manual hand crank is optional.

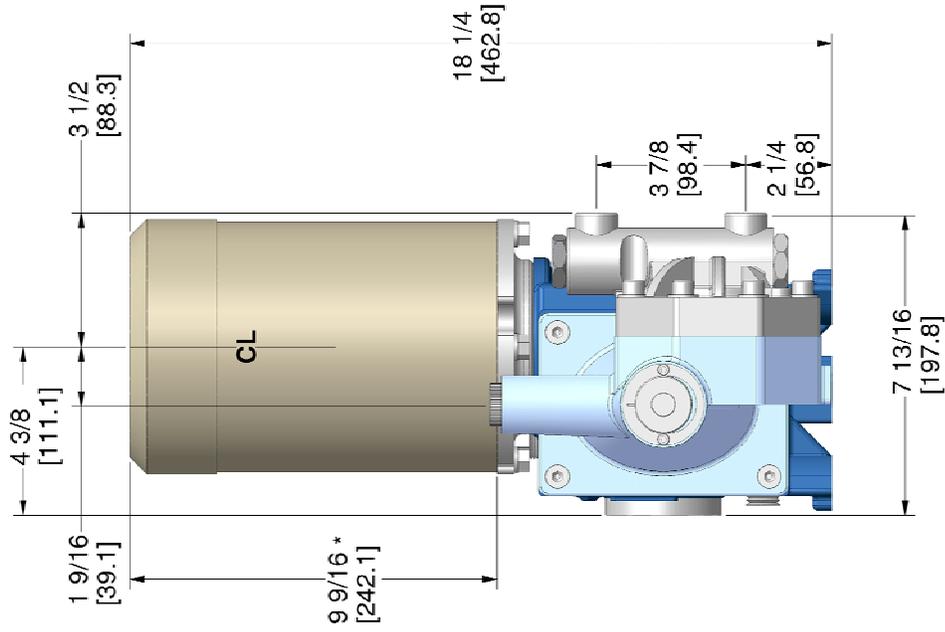
Neptune Electronic Stroke Control consists of a Linear Actuator with required fittings and Adapters needed to mount the Actuator on a Neptune 6000 Series Pump. The stroke control is mounted to the pump prior to shipment.



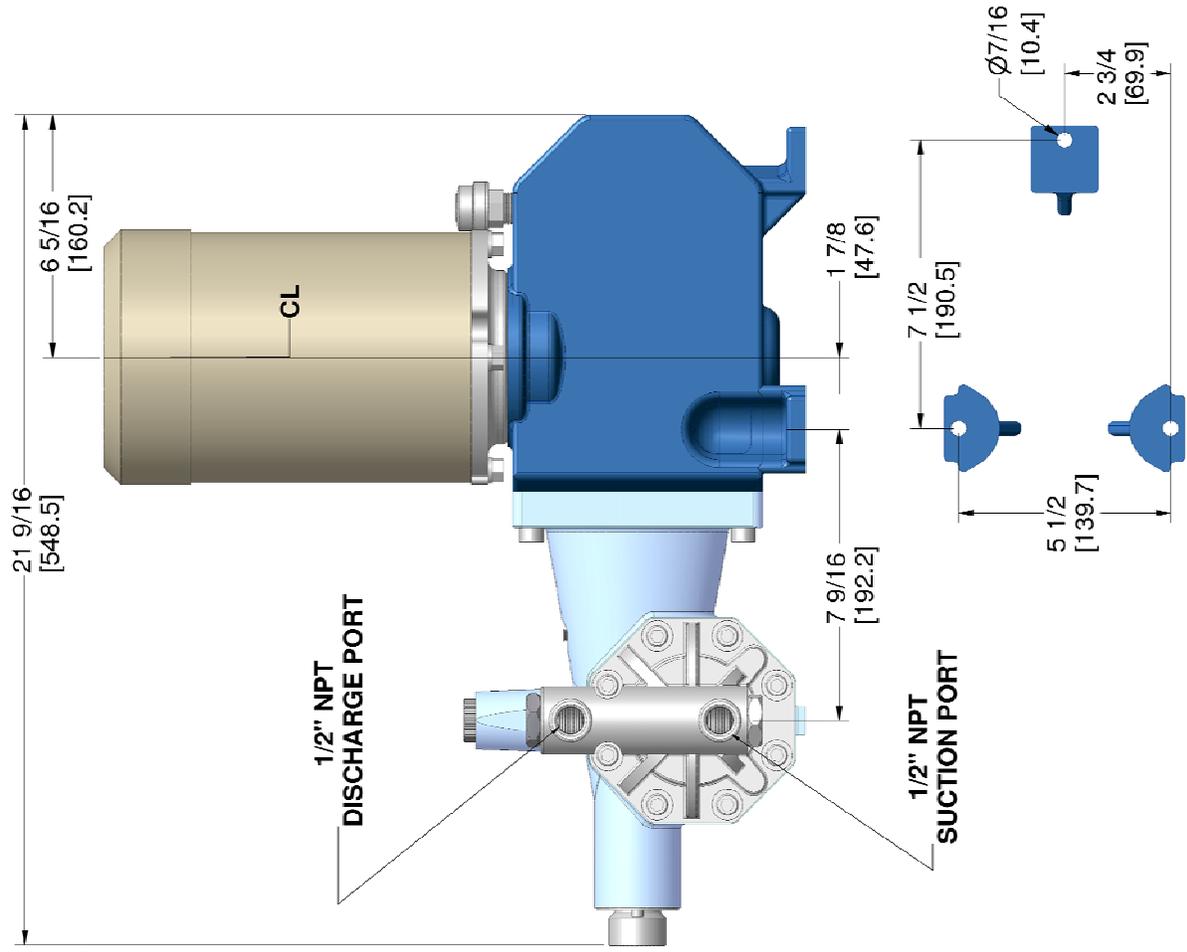
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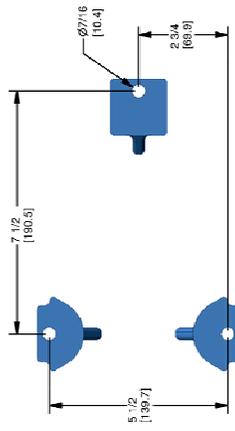
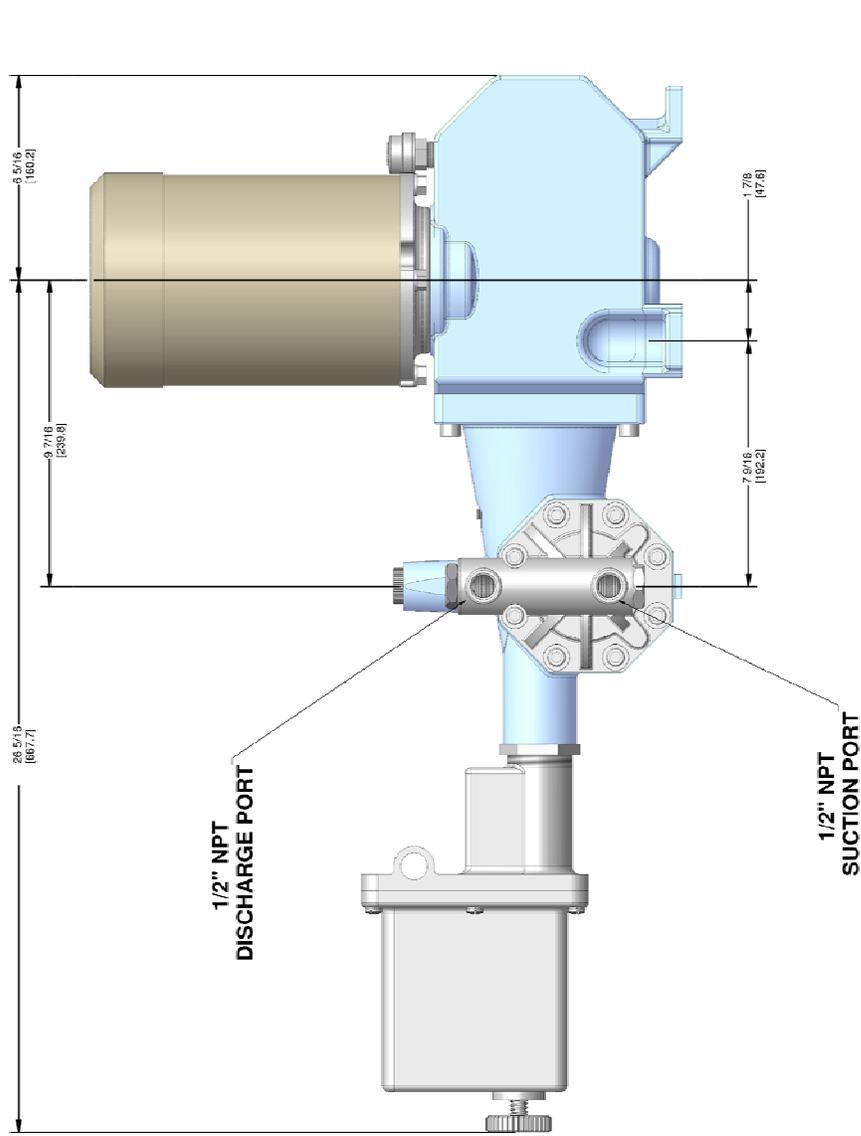
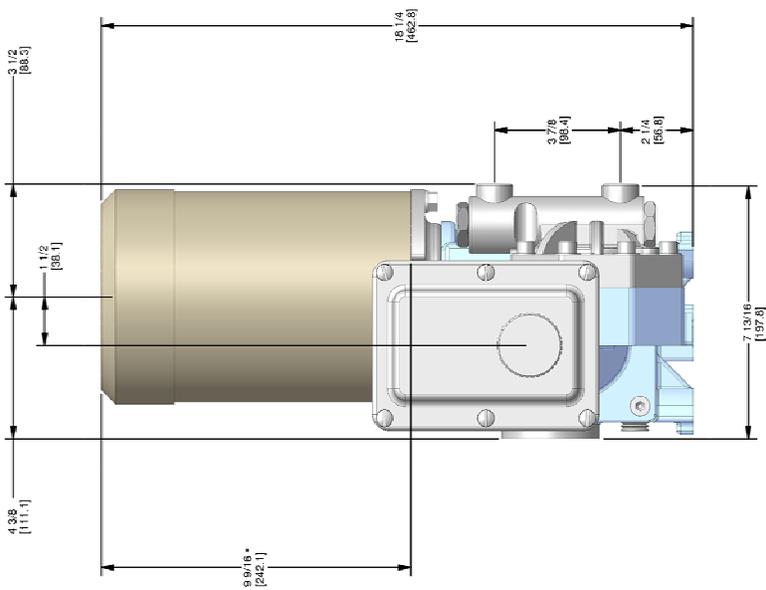
An optional Remote Control Station is available for use with the Stroke Control to permit remote Manual control and Remote indication of the Pump capacity settings.

For installation, Calibration setting, maintenance and troubleshooting, see “NEPTUNE ELECTRONIC STROKE CONTROL INSTRUCTION manual”.



* MOTOR DIMENSION CHANGES WITH MOTOR TYPE





MOUNTING HOLE DETAILS

* MOTOR DIMENSION CHANGES WITH MOTOR TYPE

SECTION IX DOUBLE DIAPHRAGM OPTION

Special Instructions for Series 6000 “dia-Pumps” with Double Diaphragm

The instructions below are for Neptune’s optional Double Diaphragm Kit.

Use of a double diaphragm allows diaphragms to be monitored and provides an early warning upon failure of either diaphragm allowing repairs to be made before process fluid can mix with the pump’s hydraulic fluid.

Neptune’s double diaphragm is a kit, which may be retrofitted to any pump currently in service or may be installed on a new pump at the factory.

Figure 4, illustrates a Double Diaphragm Assembly. An intermediate plate is located between the oil and liquid heads with one diaphragm on each side of the intermediate plate. The Intermediate Plate is connected to a rupture alarm or pressure switch via a capillary system. The area between the diaphragms is evacuated. Rupture in either diaphragm produces an increase in volume and, therefore, a pressure increase, which can be sensed by a pressure switch for alarm purposes.

DISASSEMBLY OF INTERMEDIATE PLATE

- 11.0.0 Shut pump off and disconnect suction and discharge piping. Remove drain plug and drain hydraulic fluid from the gearbox.
- 11.0.1 Remove 8 Screws and remove the liquid head assembly. Some hydraulic oil and process fluid will spill out when the head is removed.
- 11.0.2 The intermediate plate, which is between the pump heads can be removed easily.
- 11.0.3 Remove the rupture alarm (pressure switch) and clean the capillary system.
- 11.0.4 Replace one or both diaphragms if needed.
- 11.0.5 To reassemble reverse above procedure. Be certain that parts align properly.

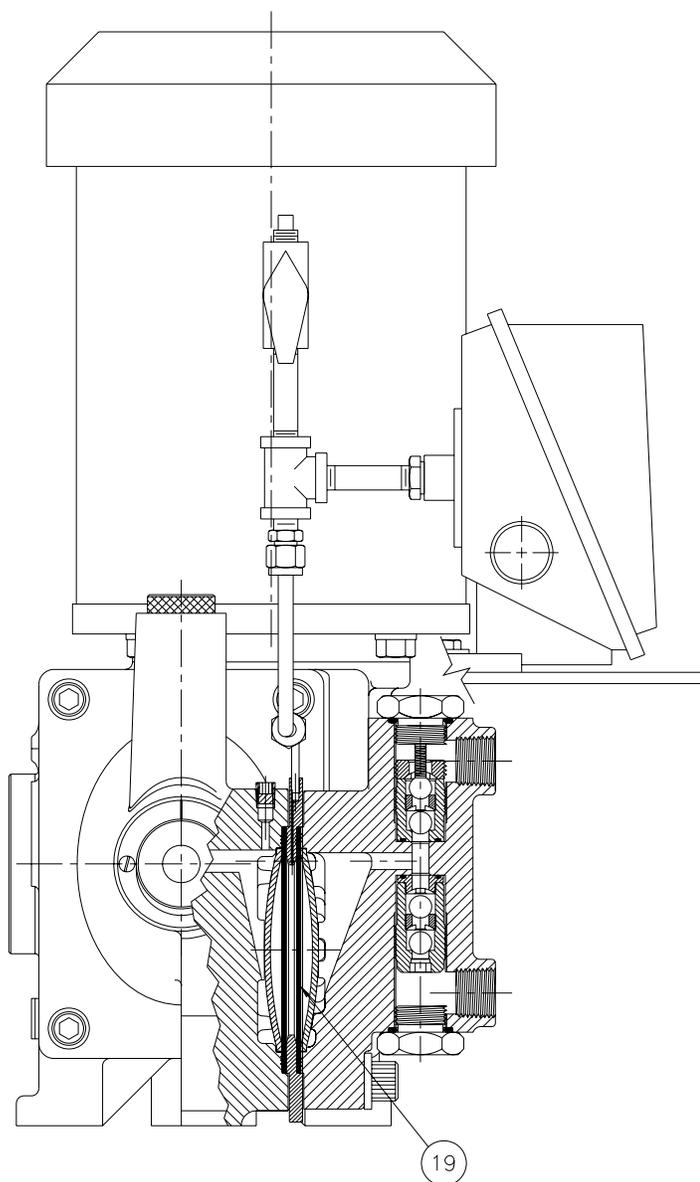


FIGURE 4

VACUUM AIR FROM INTERMEDIATE SPACE

- 11.0.6 Open valve Item No. 5 (Figure 5).
- 11.0.7 To remove air, attach the vacuum pump with a hose connection Item No. 6 to the valve Item No. 5 (Figure 5). The intermediate space is evacuated to 3 psig for normal operating conditions.
- 11.0.8 Close valve Item No. 5 (Figure 5).

11.0.9 Remove the vacuum pump. Plug valve Item No. 5 with a 316SS pipe plug Item No. 12 (Figure 5)

11.0.10 Reinstall the Pump

11.0.11 Follow procedure in Neptune Standard Operating and Instruction Manual for Initial Pump Startup

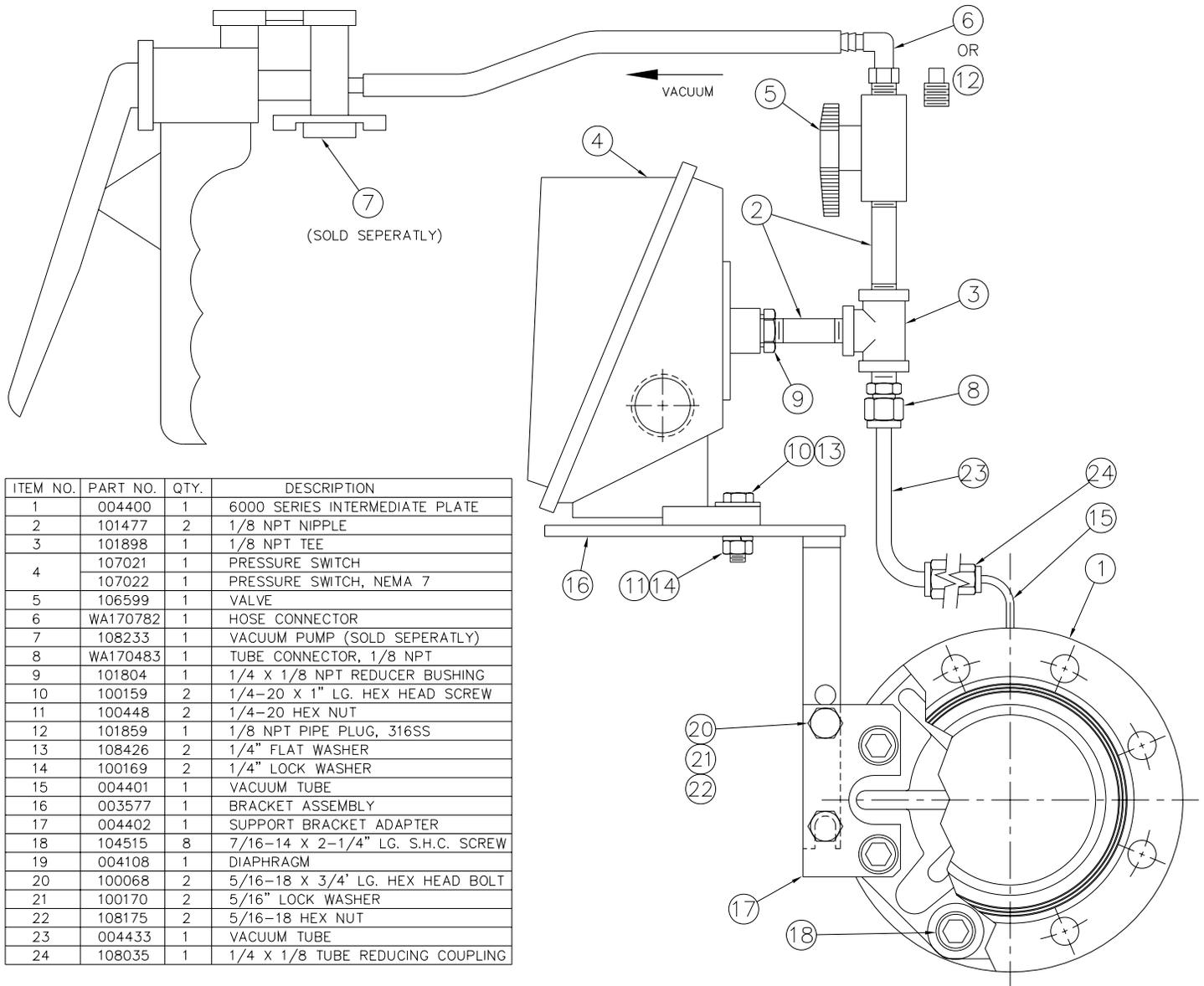


Figure 5

NOTE: Neptune furnishes a Mityvac[®] vacuum pump from Mityvac[®] No. 6810 automotive test kit available at many automotive parts store. (Unit furnished by Neptune is less gage and automotive adapters)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: EP 90 Gear Oil
Product Code:
Generic Name: Heavy-duty, Multi-grade Gear Oil
Chemical Family: Petroleum Hydrocarbons & Additives
Manufacturer: Scot Lubricants
 1801 E. Tremont Street
 P.O. Box 326
 Allentown, PA 18105

Emergency Telephone Numbers
Information: 610-433-2527 8am-5pm - EST M-F
CHEMTREC: 800-424-9300 24 hrs - every day

2. CAUTION Summary of Hazards

May cause mild eye irritation and/or mild skin irritation and inflammation. Avoid eye contact and prolonged and/or repeated skin contact.

HAZARD RATING

TOXICITY - 1	0=INSIGNIFICANT 1=SLIGHT
FLAMMABILITY - 1	2=MODERATE 3=HIGH
REACTIVITY - 1	4=EXTREME

3. Fire Fighting Measures

Flash Point (Method)	Autoignition Temperature (Method)	Flammable Limits in Vol
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4. FIRST AID MEASURES

INHALATION: Move to fresh air
EYE CONTACT: Flush with water for at least 15 minutes. If irritation persists, obtain medical assistance.
SKIN CONTACT: Wash with soap and water until no odor remains. If redness or swelling develops, obtain medical assistance. Wash clothing before reuse.
INGESTION; Practically non-toxic. Induction of vomiting not required. Obtain emergency medical attention. Small amounts, which accidentally enter mouth, should be rinsed out until taste of it is gone.

5. FIRE FIGHTING MEASURES

FLASHPOINT (METHOD): 390°F Minimum COC; 201°C Minimum COC
FLAMMABLE LIMITS: Not established.
AUTO-IGNITION TEMP: 675°F Estimated; 359°C Estimated
EXTINGUISHING MEDIA: Water spray, dry chemical, carbon dioxide (CO2), foam.
FIRE FIGHTING INSTRUCTIONS: Avoid breathing smoke and vapor.
FIRE FIGHTING EQUIPMENT: Wear self-contained breathing apparatus and protective clothing. Use water spray to keep fire-exposed containers cool.
HAZARDOUS COMBUSTION PRODUCTS: Normal combustion forms carbon dioxide and water vapor; incomplete combustion can produce carbon monoxide.

Revision: 05/05/2007 NA= Not Applicable ND=No Data NE=Not Established

11. TOXICOLOGICAL INFORMATION – cont'd

SEVERELY SOLVENT REFINED HEAVY PARAFFINIC PETROLEUM OIL: INHALATION: Low acute toxicity. SKIN: Practically non-toxic if absorbed; may cause moderate irritation with prolonged and repeated contact. EYE: Minimally irritating on contact. INGESTION: Practically non-toxic if swallowed.

CALCIUM SULFONATE: INHALATION/INGESTION: No data available. SKIN: Moderate irritant. Cause allergic skin reaction in animals. EYE: Moderate to severe irritation.

BUTYLATED PHENOL: No data available for all routes of exposure.

ZINC DIALKYL DITHIOPHOSPHATE: INHALATION: Toxic hydrogen sulfide is generated when heated above 155 deg. F. This can cause respiratory collapse, coma, or death. SKIN: Prolonged or repeated contact may cause moderate irritation, redness, drying, cracking, and dermatitis. EYE: Irritant. ORAL: Harmful if swallowed.

ACRYLIC COPOLYMER: No data available for all routes of exposure.

2-ETHYLHEXANOL: INHALATION: Overexposure may cause nose/throat irritation, nasal discomfort and discharge, chest pain, cough, headache, nausea, vomiting. SKIN: Irritant. Prolonged/repeated contact may cause redness and swelling. Prolonged widespread absorption caused CNS (Brain) depression, stupor, and unconscious-ness in animals. EYE: Severe irritant. May cause corneal injury. ORAL: Moderately toxic. May cause abdominal discomfort, nausea, vomiting, diarrhea, unconsciousness, and other CNS (Brain) effects. Liver and kidney injury (repeated ingestion). PREGNANT RATS: Skin contact up to 3 ml/kg. Maternal toxicity, but no birth defects; oral dose 2 ml/kg. Embryo/fetal toxicity and possibly increased birth defects.

TOLUENE: INHALATION: Vapor harmful. Overexposure to high concentration will cause eye, nose, and throat irritation. CNS (Brain) effects, dizziness, breathing difficulties, coma, and death. Reports of heart beat irregularities from massive exposure. Prolonged overexposure can cause brain, liver, kidney effects and/or damage. ORAL: Harmful or fatal if swallowed. PULMONARY ASPIRATION HAZARD: Can enter lungs and cause damage.

PREGNANT: May cause mental and/or growth retardation in children of female solvent abusers. Prolonged breathing in rats was toxic to fetuses and mothers – 15000 ppm. No birth defects-5000 ppm. No effects 750 ppm.

12. ECOLOGICAL INFORMATION

ECOTOXICITY: No data available.

13. DISPOSAL INFORMATION

Follow federal, state, and local regulations. Not RCRA hazardous waste if uncontaminated. If “used”, RCRA criteria (ignitability, reactivity, corrosivity, toxicity characteristics) must be determined. Do not flush to drain/storm sewer. Contract to authorized disposal service.

14. TRANSPORTATION INFORMATION

DOT

PROPER SHIPPING NAME	Petroleum Lubricating Oil
HAZARD CLASS	Not regulated
ID NUMBER	Not regulated
LABEL REQUIRED	Not regulated
IMDG PROPER SHIPPING NAME	N.D.
IATA PROPER SHIPPING NAME	N.D.

15. REGULATORY INFORMATION

TSCA: This material complies with the TOXIC SUBSTANCES CONTROL ACT (15 USC 2601-2629) and is listed in the TSCA Inventory.

SARA 302 THRESHOLD PLANNING QUANTITY		N/A	
SARA 304 REPORTABLE QUANTITY		N/A	
SARA 311/312 REPORTING	Health	Immediate (acute)	No
	Health	Delayed (Chronic)	No
	Physical	Fire	No
	Physical	Sudden Release of Pressure	No
	Physical	Reactive	No

When a product and/or component is listed below, the regulatory list on which it appears is indicated.

ZINC DIALKYL DITHIOPHOSPHATE – NJ 01
 TOLUENE – CA FL MA MN NJ PA 01 07
 2-ETHYLHEXANOL – MA PA

- | | | |
|---------------------|---------------------------|-----------------------|
| 01=SARA 313 | 02-SARA 302/304 | 03=IARC CARCINOGEN |
| 04-OSHA CARCINOGEN | 05=ACGIH CARCINOGEN | 06=NTP CARCINOGEN |
| 07=CERCLA 302.4 | 08=WHMIS CONTROLLED PROD. | |
| 10-OTHER CARCINOGEN | | |
| PA=PA RTK | NJ=NEW JERSEY RTK | CA=CALIFORNIA PROP 65 |
| MA=MASS. RTK | MI=MICHIGAN 406 | MN=MINNESOTA RTK |
| FL=FLORIDA | RI=RHODE ISLAND | IL=ILLINOIS |
| NY=NEW YORK | WV=WEST VIRGINIA | CT=CONNECTICUT |
| LA=LOUISIANA | ME=MAINE | OH=OHIO |

16. OTHER INFORMATION

SCOT LUBRICANTS OF PA, INC.
1801 E. TREMONT STREET
P.O. BOX 326
ALLENTOWN, PA 18105
610-433-2527

The information on this form is furnished solely for the purpose of compliance with the OSHA Act, and shall not be used for any other purpose. The information herein is given in good faith and is based on data considered accurate. However, no warranty, expressed or implied, is made regarding the accuracy of these data or the result to be obtained from the use thereof.

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