SERVICE MANUAL FOR
BLUE MAX 3 HYDROSTATIC TEST PUMP

EST Group's Blue Max 3 pump is equipped with a SC, Southern California Hydraulic Engineering Corporation's pump. This pump may be accessed by removing the rear panel on the Blue Max 3 unit. See the following pages for service guides and technical information regarding the pump.

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.
In USA and Canada: tel: 800-355-7044, fax: 215-513-4333, e-mail: info@expansionseal.com
In Europe: tel: +31-172-418841, fax: +31-172-418849; e-mail: info@estgrp.nl
In Asia: tel: +65-6745-8560, fax: +65-6742-8700, e-mail: estasia@singnet.com.sg
On the Internet: www.expansionseal.com

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SOUTHERN CALIFORNIA HYDRAULIC ENGINEERING CORPORATION
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www.schydraulic.com

INSTALLATION & OPERATING INSTRUCTIONS FOR SC AIR OPERATED HYDRAULIC PUMP 10-6 SERIES

PLEASE READ CAREFULLY

1. MOUNTING THE PUMP

There are drilled and tapped holes in the base of the pump for this purpose. The size, quantity, and spacing of these holes are shown on the parts list furnished with each pump. Mounting of the pump may be in any position, vertical preferred. When mounting is in inverted position, a drain hole should be provided to drain off any liquid that might accumulate in the pilot valve air chamber. Contact the factory or the closest SC distributor for information on the inverted modification.

IMPORTANT: The pump is designed so that the air motor head may be rotated in increments of 45 degrees to facilitate connection to air and hydraulic lines. This may be done by removing the eight bolts that clamp the air motor together. The head may then be rotated to any desired position that will also allow proper alignment of the bolts in the head and the base. When the bolts are replaced, be sure that the air cylinder is in proper position against the flanges on the pump head and the air cylinder end before tightening the bolts that clamp the air motor together. Use a soft hammer to position the flanges tightly against the air cylinder ends BEFORE tightening the bolts. Failure to do this can result in over-tightening the bolts initially, and when bolts on the opposite side are drawn up, this may result in the bolt lugs being broken or twisted off when the assembly is drawn down into position. Bolts should be secured lightly at first and then drawn up in sequence until uniform torque has been applied to all of the bolts around the perimeter of the pump. (19-19 ½ft-lbs.)

2. CONNECTION TO AIR SUPPLY LINE

A filter-regulator-lubricator assembly, located as close to the pump as possible, is required in the air supply line. The air input to the pump is a 1/2" npt port and is marked "AIR IN". The "FRL" assembly should be connected to it in the order named, with the lubricator adjacent to the pump. The pump will deliver at its maximum rated capacity at 100 psi & 56 scfm of free air with a 1/2" inside diameter supply line. Use of a smaller size supply line will not allow the pump to operate at full capacity.

3. LUBRICATION

A good grade of petroleum based lubricating oil should be used such as Castrol Braco Micronic 783, or any good grade of oil with equivalent properties. Automatic Transmission Fluid Type A will also be satisfactory when recommended lubricants are not available. For good lubrication, one drop for every 20 strokes of the pump is ample. If an excessive amount of oil appears to be flowing through the pump during operation, lubrication may be somewhat reduced to avoid excessive waste.

4. AIR EXHAUST

The air exhaust from the pump is a 1" npt port and is marked "AIR OUT". A muffler is desirable for quietness of operation. If no muffler is available and noise is objectionable, exhaust may be piped away to a remote location. Pipe or hose can be used for this purpose and should have a 1" inside diameter or larger so that the efficiency of the pump will not be impaired.

5. CONNECTION TO FLUID SUPPLY LINE

The size and type of port is shown on the pump assembly drawing and is marked "FLUID IN" on the pump. Clean fluid is very important. Grit or foreign matter in the fluid supply will damage hydraulic components, resulting in improper functioning of the pump. A free flow type of filter (100 mesh) with ports no smaller than the inlet port of the pump should be used to obtain maximum performance and avoid the possibility of cavitation. To ensure proper priming of the pump, maximum performance, and to avoid the possibility of cavitation, a fluid supply with a positive head is recommended. This positive head can be accomplished in one of two ways:

(1) Positioning the fluid level of the reservoir above the level of the pumps inlet port.
(2) Providing a pressurized fluid supply. This pressure is not to exceed 150 psi.

CAUTION: THIS PUMP IS DESIGNED FOR EITHER PETROLEUM BASED HYDRAULIC OIL OR PLAIN WATER (AS SPECIFIED WHEN ORDERING) AND IS NOT GAURANTEED TO PUMP FLUIDS OTHER THAN SPECIFIED HEREIN, OR FLUIDS THAT HAVE CORROSIVE QUALITIES WHICH WILL DETERIORATE THE PACKING OR METAL PARTS OF THE PUMP. CONTACT THE FACTORY OR THE CLOSEST SC DISTRIBUTOR FOR INFORMATION ON PUMPS FOR SPECIAL FLUIDS.

6. CONNECTION TO FLUID OUTLET OR PRESSURE SIDE

The size and type of port is shown on the pump assembly drawing and is marked "FLUID OUT" on the pump. The same care should be taken in making connections to this port as is necessary for all high pressure connections. Only fittings sufficiently rated for the pumps maximum output pressure should be used.

7. STARTING THE PUMP

(a) Fill the lubricator unit in the air supply line with oil as recommended in item #3

(b) Screw down the pressure regulator to "0" psi before turning on air into the pump.

(c) Release pressure side of pump to reservoir or atmosphere so the pump can prime itself.

CAUTION: BE SURE THAT THE FLUID SUPPLY REACHES THE PUMP PROMPTLY UPON STARTING. RUNNING THE PUMP DRY MAY DAMAGE HYDRAULIC COMPONENTS.

(d) Screw down the pressure regulator slowly until the pump starts. Pump should start on 10 to 15 psi of air under normal conditions. Continue to increase air pressure to 40 psi and let the pump run until all air has been purged from the system.

(e) Check the lubricator unit to see that the proper amount of oil is being supplied to the pump as recommended in item #3

(f) After steps (a) through (e) have been completed, air pressure to the pump may be regulated until the desired hydraulic pressure is attained in the system.

NOTE: All models of the pump are designed to operate in the range of 10 to 100 psi air pressure. Higher air pressure may be applied on intermittent duty but not to exceed 150 psi and is not recommended for continuous operation. The 10-6 series "201" and "301" models should not be operated except on intermittent duty at hydraulic pressures above 30,000 psi, as the life expectancy of the packing in the hydraulic assembly will be relatively short when operating continuously at pressures above 30,000 psi. The 10-6 Series 402 model should not be operated except on intermittent duty at hydraulic pressures above 40,000 psi.

8. TROUBLE SHOOTING GUIDE

The pump has been thoroughly tested at the factory and found to be in perfect working condition. If for some reason the pump does not function properly, do not attempt to repair it, but contact the factory or the closest SC distributor for instructions. When calling have the pump model number, serial number, and a brief description of the problem readily available. Before doing this, the following items should be checked:

a) Are all connections to the pump correct? Verify that the air supply line is connected to the port marked "AIR IN", and the fluid supply is connected to the port marked "FLUID IN". If either of these connections are incorrect, the pump will not function properly.

b) Is there an adequate and unrestricted air supply? Verify that sufficient air pressure and flow are available to produce the desired pump output. An insufficient air supply can hinder the published performance data of the pump.

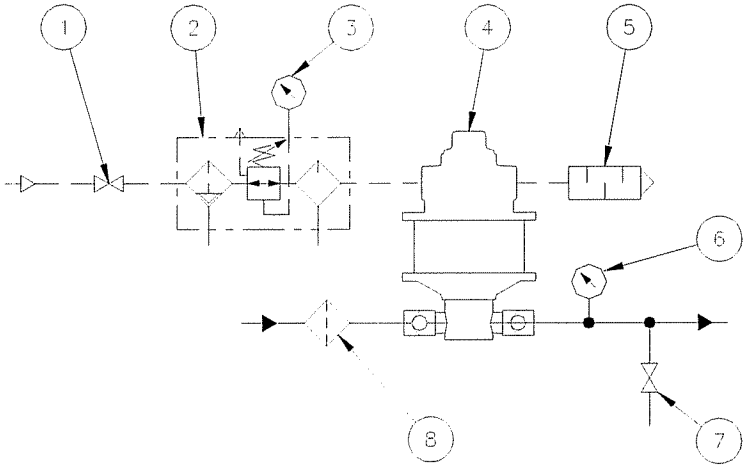
c) Is there an adequate and unrestricted fluid supply? Verify that the reservoir is full and/or the fluid supply does reach the pump. if not, the pump will not prime properly.

d) Is the pressure side of the pump unloaded? Verify that the pressure side of the pump is unloaded. If not the pump will not prime properly.

Upon verifying all of the above, begin item #7 again. If the pump still does not function properly, contact the factory or the closest SC distributor for instructions.

TYPICAL CIRCUIT FOR INSTALLATION

1. AIR SHUT-OFF VALVE
2. FRL ASSEMBLY
3. AIR PRESSURE GAUGE
4. SC PUMP
5. EXHAUST MUFFLER
6. HYDRAULIC PRESSURE GAUGE
7. FLUID BLEED VALVE
8. HYDRAULIC FILTER



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SERVICING INSTRUCTIONS
FOR SC AIR OPERATED HYDRAULIC PUMP
D6 SERIES

1. **TO DISASSEMBLE THE AIR MOTOR** - Refer to Air Motor Assembly (C10515) for Part Numbers and cross section of the Pump.

   (a) Remove the eight 3/8" bolts (Item #27) that clamp the Air Cylinder (Item #23), between the Head (Item #1) and the Air Cylinder End (Item #24). Remove the Air Head by tapping on a fitting screwed into either the "AIR IN" or "AIR OUT" ports with a soft hammer.

   NOTE: Inspect all parts for wear or damage and replace as necessary. It is especially important that all parts that operate in the O-Rings or Packing be free from pits, scoring or any other defects that may cause excessively rapid wear of O-Ring and Packing, since leaks will develop almost immediately under these conditions and satisfactory performance will not result. When removing Retaining Rings care must be taken not to damage the groove in which it seats. Damaged to the groove can decrease the holding effectiveness and may allow the Retaining Ring to become disengaged during operation. Careless removal of the Retaining Rings can damage the groove creating "BURRS". These "BURRS" can migrate throughout the Air Motor Assembly causing major damage to all internal components.

   (b) Remove the Retaining Ring (Item #22) from the bottom of the Air Piston (Item #20), and remove the Hydraulic Piston. The Pilot Valve Assembly (Item #10) may then be pushed out through the bottom of the Air Piston.

   (c) Remove the Retaining Ring (Item #17) from the Head Assembly. Remove the Bearing Assembly (Item #16) by lifting or prying it out with a hammer handle or similar tool. The APA Piston (Item #12) may also be removed at this time. The Bearing Assembly has a molded rubber seat and should be replaced if worn or damaged. The O-Ring (Item #19) in the Bearing Assembly, the O-Ring (Item #3) in the upper part of the APA Piston, and the O-Ring* on the Pilot Valve Assembly head should be replaced as a routine matter while the Pump is disassembled as they are especially important for maximum performance.
   *(This O-Ring is Part #P11000-216 (#12-6227N021), see Pilot Valve Assembly 11-6027A000)

   (d) The Head Assembly has a Rubber Bumper (Item #4), inserted in the upper portion of the body. This acts as an air seal and also a cushion for the Air Piston Actuating Valve. If worn or damaged it should be replaced.

   (e) When the Dry Seal (Item #6) and the O-Rings (Item #8) are worn or damaged, they need to be replaced. Remove the Retaining Ring (Item #13) by using a small screwdriver. Slide the Dry Seal off of the APA Piston (Item #12). The O-Ring (Item #7) inside the Dry Seal should also be replaced. When installing the Dry Seal (Item #6) and the O-Rings (Items #7 & #8), a small coat of silicone grease or other suitable lubricant should be applied.

   ****CAUTION: DO NOT** remove the Sleeve from the Head Casting unless replacement is to be made

2. **REPAIRING THE PILOT VALVE ASSEMBLY** – Refer to Pilot Valve Assembly (11-6027A000) for this process. The Pilot Valve Assembly (11-6027A000) has an Air Check Assembly (11-6032X403) located in the lower end. Remove the Retaining Ring (Item #7, 12-R093S000), which locks the Valve Seat (Item #6 - 11-5024A403) in place, and remove the Valve Seat with a spanner wrench. The Air Check Assembly (Item # 5 – 11-6032X403) and the Spring (Item #4 - 11-5016M001) will then drop out and may be inspected for wear or damage. Replace the springs and worn parts as required. Do not disassemble Air Check (Item #5). The Air Check will only be assembled and properly adjusted at the factory.

3. **TO REPLACE THE PACKING IN THE HYDRAULIC CYLINDER** – It is not necessary to dismantle the Air Motor. Proceed as follows: Disconnect the air-supply line, remove the muffler if necessary and loosen the Set Screw (Item #26) in the Air Cylinder End (Item #24). Unscrew the Air Motor from the Hydraulic Cylinder. The Hydraulic Piston will be removed with the Air Motor, permitting convenient replacement of the packing in the Hydraulic Cylinder. The Parts List for the Hydraulic Assembly will give the size and kind of packing required, and when installing new packing, be sure that the Backup Rings are properly in place. If they are damaged or not installed correctly, the "O" Ring will malfunction, with resultant loss of pressure and packing failure. When replacing the Air Motor, install a new Gasket, part #11-5028N000 and see that the Hydraulic Piston is in proper alignment before screwing the Air Motor down into position. Tighten the Air Motor securely and also the Set Screw (Item #26) in the Air Cylinder End (Item #24).
   TO REPLACE THE PACKING IN 10-6000W151 THROUGH 10-6000S402 – Refer to Hydraulic Assembly Drawings 11-6165W151 through 11-6165S301 and 11-6169S000. Using a Pin Wrench remove Retainer Part #11-6158, 11-6162 or 11-6176, remove Bearing –Upper Part #11-6163 or 11-6177, Back-up Part # D10653 Seal-Rod Part #P11202.Install new Seal-Rod and Back-Up, replace Bearing-Upper and Retainer. Torque Retainer to 10-12 Ft Lb.

NOTE: Models with Isolator Attachment or "V" Ring packing in the Hydraulic Cylinder will require removal of the Isolator or the Adapter on "V" Ring packed Cylinders to replace the packing.

4. **THE HYDRAULIC PISTON** has a Rubber Bumper, Part #11-5051P000, in the head. If replacement is required remove the Cap Screw, part #12-25F37SBC45Z, and install new Rubber Bumper and Washer, part #12-5001C407. Apply "LOCTITE" sealant to the Cap Screw threads when replacing and tighten securely, but not to exceed four foot pounds of torque.

   NOTE: The Piston stem is chrome plated and honed and lapped to a very close tolerance with the Hydraulic Cylinder. Should it show indications of wear or being scored (usually due to foreign matter being present in the hydraulic fluid), the entire Hydraulic Piston and Cylinder Assembly, Part #11-6011XXXX, should be returned to the factory for repair or replacement as required.

5. **REPAIRING OR REPLACING THE HYDRAULIC CHECK VALVES** – These Valves should not give any trouble unless foreign matter such as dirt or grit are present in the fluid supply. If a leak develops remove the Check Valves from the Hydraulic Cylinder. Remove the "O" Ring and replace with a new one. Inspect the ball seat in the Valve while the "O" Ring is removed. If it shows any indication of wear or damage, the entire Valve Assembly should be replaced. Refer to Parts List for Part Numbers and cross sections of the Valves.

   NOTE: There are several different model pumps. When ordering parts, give the Part Number the Pump Model Number and Serial Number.

6. When Operations described in Paragraphs 1 to 5 inclusive have been completed, the entire unit will have been dismantled and all parts inspected for wear and damage. It is especially important that all parts that operate in the "O" Rings or Packing be free from pits, scoring or any other defects that may cause excessively rapid wear of "O" Rings and Packing. Since leaks will develop almost immediately under these conditions and satisfactory performance will not result.

7. **REASSEMBLING THE PUMP** – Reverse the procedure used for dismantling, making sure that all Retaining Rings are properly in place and that no "O" Rings have been damaged in reassembly. Before installing the Retaining Rings, inspect the groove for damage and the presence of foreign matter. Damage to the groove can decrease the holding effectiveness of the Ring, while foreign matter can cause contamination of the pump leading to failure.

   IMPORTANT: *When reassembling the Air Motor be sure that the Air Cylinder, Part #11-6151P000, is in proper position against the flanges on the Pump Head and the Air Cylinder End before tightening the bolts that clamp the Air Motor together. Use a soft hammer to position the flanges tightly against the Air Cylinder Ends BEFORE tightening the bolts. Failure to do this can result in over-tightening the bolts initially and when the bolts on the opposite side are drawn up this may result in the bolt lugs being broken or twisted off when the assembly is drawn down into position. Bolts should be secured lightly at first then drawn up in sequence until uniform torque has been applied to all of the bolts around the perimeter of the Pump (15-17 ft-lb.).*

8. **PUMP NOT RUNNING PROPERLY** – If for any reason the Pump does not run properly, look for one of the following causes:

   (a) If the Pump appears to be short stroking and running too fast without pumping properly, it usually indicates that the Air Check Assembly is not working as it should be. (See paragraph #2 for correction procedure).

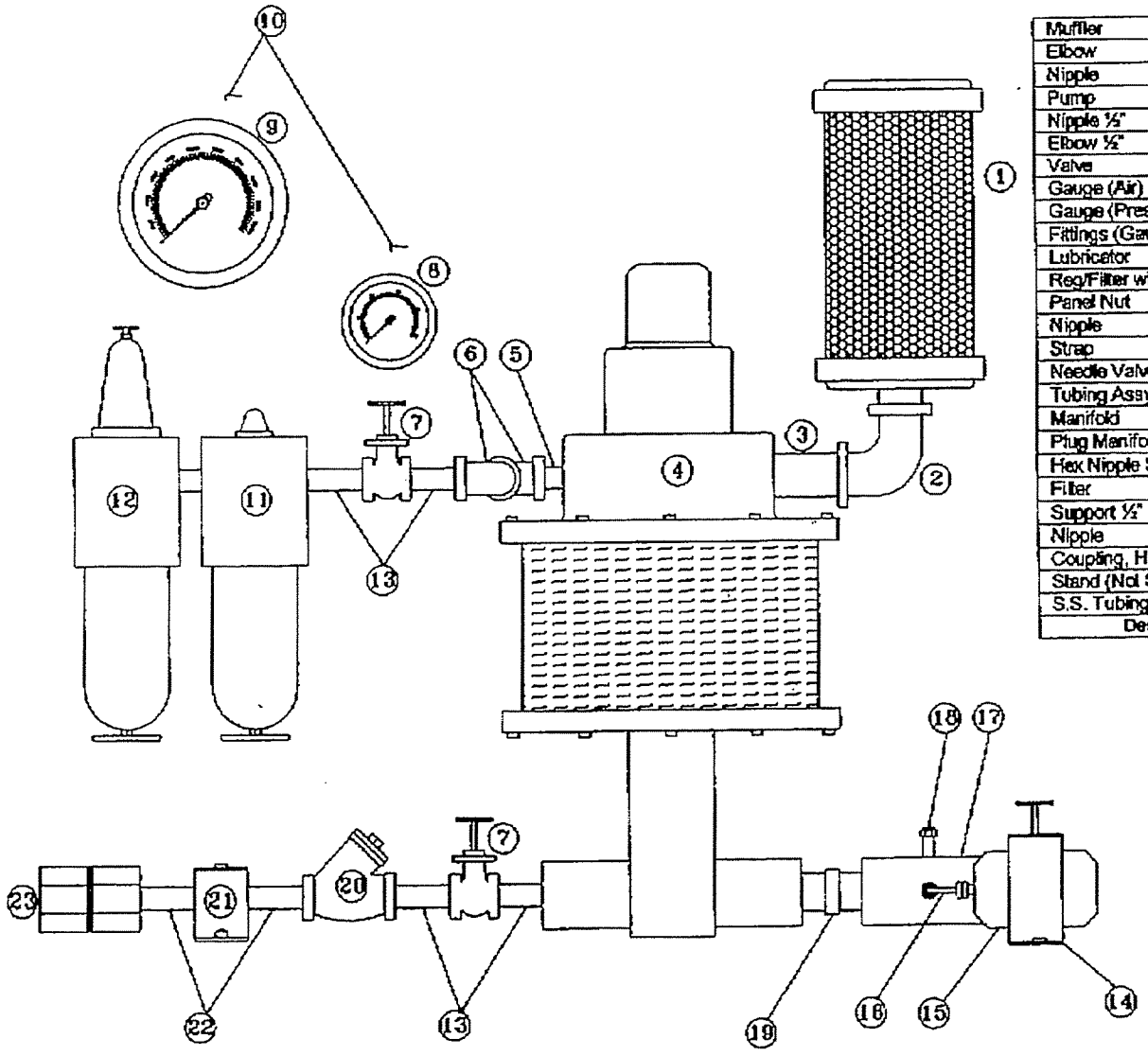
   (b) Loss of pressure may be caused by one of two reasons, the Hydraulic Check Valves have developed a leaky condition or the hydraulic fluid is bleeding past the Packing in the Hydraulic Cylinder. (See paragraphs 3, 4 and 5 for repair instructions).

   (c) Should the Pump commence to run erratically and in a jerky manner after a period of time, it is usually an indication that a seizing action is taking place in the Hydraulic Piston & Cylinder Assembly. (See paragraphs 1 and 3 for disassembly instructions). Foreign matter such as alkali, dirt, grit or chemicals that do not have sufficient lubrication qualities being present in the fluid supply usually causes this. If the Hydraulic Piston and Cylinder have not been damaged, a thorough cleaning will normally place the Pump in operation again.

   (d) For maximum volume of flow, make sure that a sufficient flow of air is supplied to the Pump. Hooking the Pump up to a smaller pipe size than the "AIR IN" port on the Pump will not allow it to run at its full rated capacity. Long runs of relatively small pipe supplying air to the Pump will have the same effect.

   (e) It is important to remember that this pump requires ***no lubrication in the air supply***.

   (f) If an excessive amount of oil or water is coming through the Pump air exhaust, check the following:
      1. The filtering unit in the air supply is not functioning properly. The bowl should be cleaned periodically to assure delivery of the clean air to the Pump.
      2. The hydraulic fluid being pumped (oil or water) may be leaking past the packing in the Hydraulic Cylinder into the Air Motor. (See paragraph #3 for correction procedure)



Description	Part #	Item #	Price
Muffler	M10	1	25.00
Elbow	6000-2	2	6.10
Nipple	6000-3	3	4.20
Pump	6000W-050	4	787.00
Nipple ½"	6000-5	5	2.10
Elbow ½"	6000-6	6	4.80
Valve	6000-7	7	10.50
Gauge (Air)	6000-8	8	48.60
Gauge (Pressure)	6000-9	9	91.00
Fittings (Gauge)	GCT-400-7-4	10	10.40
Lubricator	6000-42L93	11	56.40
Reg/Filter with Panel Nut	6000-42K97-33-49	12	98.10
Panel Nut	6000-42K49	12	3.24
Nipple	6000-13	13	4.05
Strap	6000-14	14	15.20
Needle Valve	UN2NS-PMN	15	110.00
Tubing Assy	GCT-400-1-4TA	16	21.80
Manifold	GCT-6000-17	17	65.00
Plug Manifold	GCT6000-18	18	5.80
Hex Nipple S.S.	GCT-8-HN-SS	19	17.30
Filter	6000-20	20	14.60
Support ½"	GCT-304-S3-PP-8P	21	9.10
Nipple	6000-22	22	6.05
Coupling, Hex	GCT-8-HCG-B	23	14.40
Stand (Not Shown)	GCT6000-C	24	325.00
S.S. Tubing (Not Shown)	6000-25	25	6.05/ft

NO.	BY.	DESCRIPTION	DATE	CHK'D	APPV'D
1					

GULF COAST TOOL
PASADENA, TEXAS

TPW 10,000
6000 SERIES

TITLE: ASSY PARTS LIST

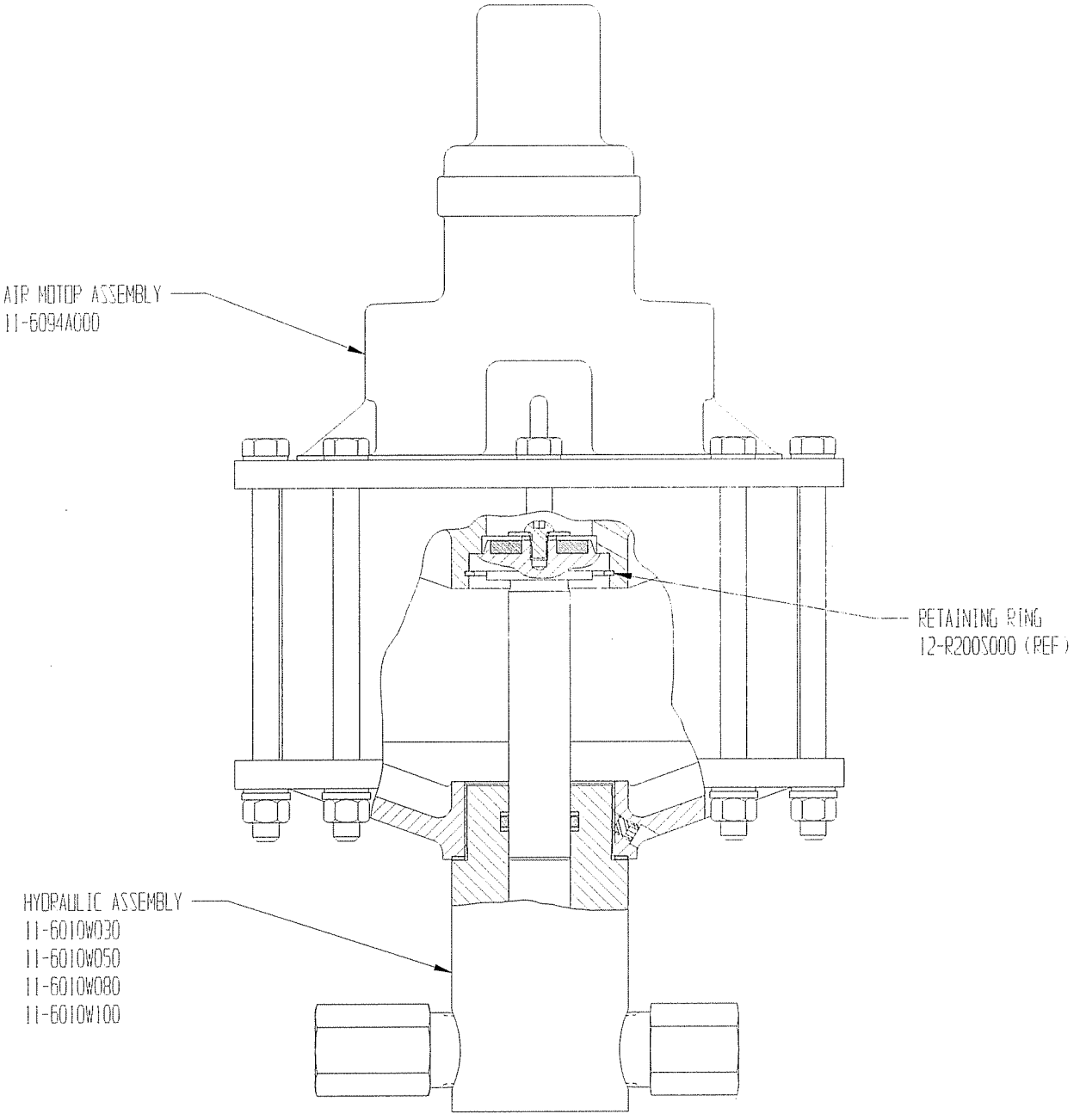
SCALE: AS NOTED
DESIGNED BY: PAT
DRAWN BY:
CHECKED BY:
PRELIMINARY BY:
PROJECT NO.:
SHEET NO.:
DATE: 7/01
REV. 0

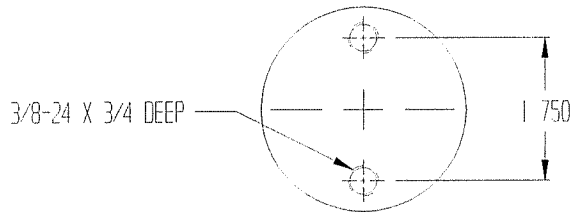
SOUTHERN CALIFORNIA HYDRAULIC ENGINEERING CORPORATION

DESIGNERS AND MANUFACTURES OF HYDRAULIC & PNEUMATIC EQUIPMENT

PUMP ASSEMBLY 10-6000W030 THRU W100

FORM 10-6000W030-100 REV 07/12/01





MOUNTING DIMENSIONS

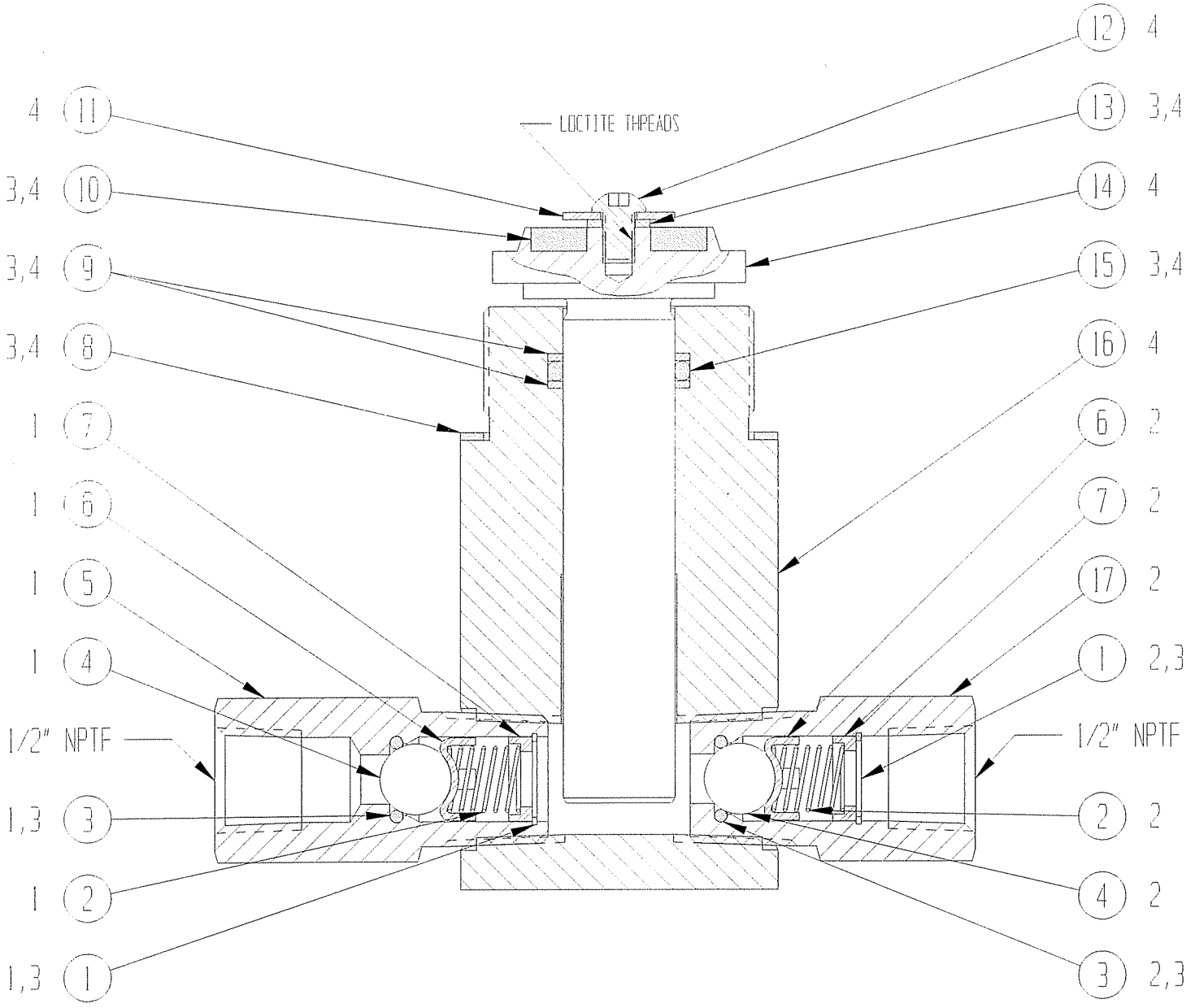
SOUTHERN CALIFORNIA HYDRAULIC ENGINEERING CORPORATION

DESIGNERS AND MANUFACTURERS OF HYDRAULIC & PNEUMATIC EQUIPMENT

FORM 11-6001OW030-100 REV 07 IC 01

HYDRAULIC ASSEMBLY 11-6010W030 THRU W100

FOR PUMP ASSEMBLY 10-6000W030 THRU W100



4* INCLUDED IN 11-6011WXXX PISTON & CYLINDER ASSEMBLY

3* INCLUDED IN 11-6099NXXX HYDRAULIC REPAIR KIT

2 INCLUDED IN 11-5023S000 OUTLET CHECK VALVE ASSEMBLY

1 INCLUDED IN 11-5024S000 INLET CHECK VALVE ASSEMBLY

* REPRESENTS PUMP ASSEMBLY RATIO NUMBER
EXAMPLE: 11-6099N030 = HYDRAULIC REPAIR KIT FOR 10-6000W030 PUMP

BILL OF MATERIALS FILE: 10-550-010.XLS

DRAWING NUMBER & DESCRIPTION: 11-6010W030 THRU W100 HYDRAULIC ASSEMBLY

11-6010 REVISION: 07/12/01

W030	W050	W080	W100	ITEM NO	QTY	PART NO	DESCRIPTION
•	•	•	•	1	2	P10202-068	RETAINING RING
•	•	•	•	2	2	11-5013S000	SPRING
•	•	•	•	3	2	P11003-112	O-RING
•	•	•	•	4	2	12-0440S562	CHECK BALL
•	•	•	•	5	1	11-5019S000	SEAT-INLET
•	•	•	•	6	2	11-5034S002	BALL GUIDE
•	•	•	•	7	2	11-5017S000	SPRING GUIDE
•	•	•	•	8	1	11-5028N000	GASKET
•				9	2	P11227-212	BACK UP
	•			9	2	P11227-115	BACK UP
		•		9	2	P11227-113	BACK UP
			•	9	2	P11227-112	BACK UP
•	•	•	•	10	1	11-5051P000	PISTON BUMPER
•	•	•	•	11	1	12-25N87WF1Z	FENDER WASHER
•	•	•	•	12	1	12-25F37SBC45Z	BUTTON HEAD CAP SCREW
•	•	•	•	13	1	12-5001C407	HELICAL SPRING LOCK WASHER
•				14	1	11-6008S030	HYDRAULIC PISTON
	•			14	1	11-6008S050	HYDRAULIC PISTON
		•		14	1	11-6008S080	HYDRAULIC PISTON
			•	14	1	11-6008S100	HYDRAULIC PISTON
•				15	1	P11000-212	O-RING
	•			15	1	P11000-115	O-RING
		•		15	1	P11000-113	O-RING
			•	15	1	P11000-112	O-RING
•				16	1	11-6009B030	HYDRAULIC CYLINDER
	•			16	1	11-6009B050	HYDRAULIC CYLINDER
		•		16	1	11-6009B080	HYDRAULIC CYLINDER
			•	16	1	11-6009B100	HYDRAULIC CYLINDER
•	•	•	•	17	1	11-5020S000	SEAT-OUTLET

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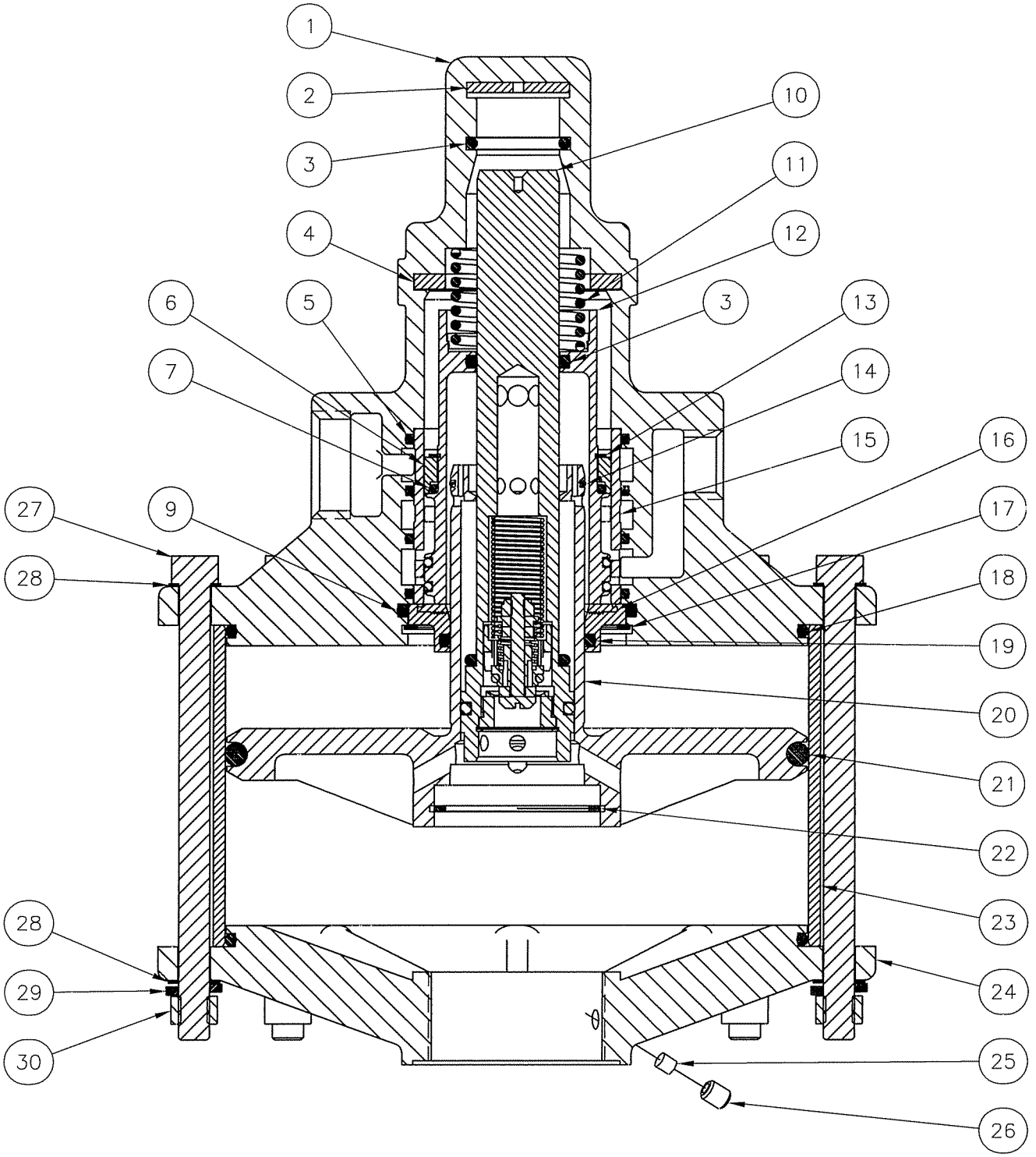
AIR MOTOR ASSEMBLY (D6 DRY LUBE) - C10515

(Sheet 1 of 2) REV.01AUG02,D.MACH



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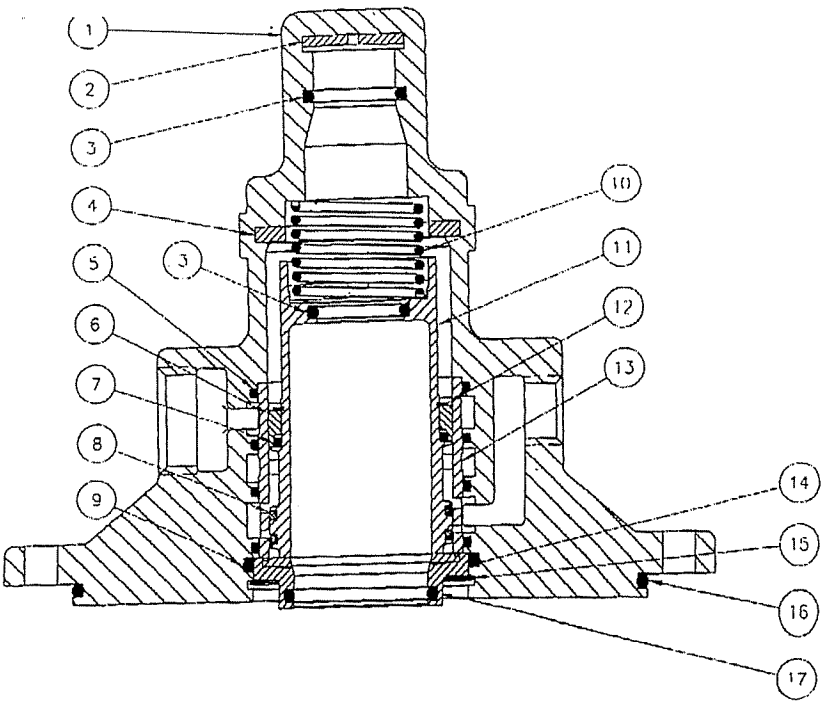
AIR MOTOR ASSEMBLY (D6 DRY LUBE) - C10515

(Sheet 2 of 2) REV 01AUG02,D MACH

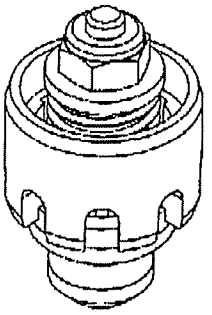
AIR MOTOR ASSEMBLY – C10515, D6 DRY LUBRICATION					
ITEM	DESCRIPTION	PART NUMBER	QTY	PACKING SET (R10105)	REPAIR KIT (R10104)
1	HEAD	11–6092A001	1		
2	BUMPER	11–5012N000	1		
3	O–RING	P11000–214	2	X	X
4	BUMPER	11–5057P000	1		X
5	O–RING	P11000–144	4		
6	SEAL–DRY	D10684	1		X
7	O–RING	P11000–135	1	X	X
8	O–RING	P11003–137	2	X	X
9	O–RING	P11000–231	1	X	X
10	PILOT VALVE ASSEMBLY	11–6027A000	1		
11	SPRING	11–5005M002	1		
12	PISTON–APA	D10817	1		
13	RETAINING RING	P10263–193	1		X
14	O–RING	P11000–028	1	X	X
15	SLEEVE–APA	D10263	1		
16	BEARING ASSEMBLY	11–5047N000	1		
17	RETAINING RING	12–R262S000	1		
18	O–RING	P11000–261	2	X	X
19	O–RING	P11000–223	1	X	X
20	AIR PISTON	11–6025A000	1		
21	O–RING	P11000–439	1	X	X
22	RETAINING RING	12–R200S000	1		X
23	CYLINDER–AIR	11–6151P000	1		
24	END	11–6002A000	1		
25	PLUG	11–5172N000	1		
26	SET SCREW	12–25C313CPSS	1		
27	BOLT – HEX	P10230	8		
28	WASHER – FLAT	P10214–038	16		
29	WASHER – LOCK	P10212–038	8		
30	NUT – HEX	12–37CNFH1Z	8		

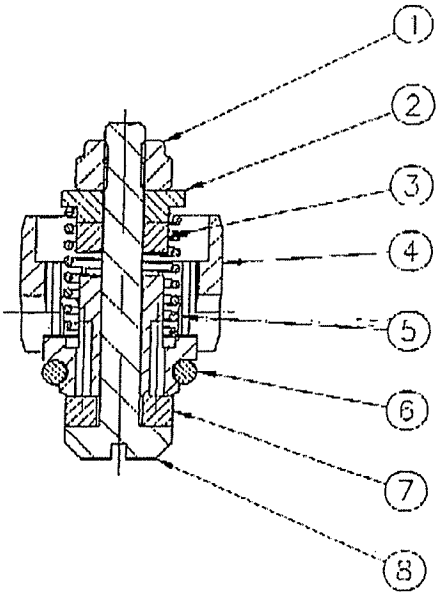
HEAD ASSEMBLY (D6 DRYLUBE) C10516



HEAD ASSEMBLY (D6 DRY LUBE) C10516					
ITEM	DESCRIPTION	PART NUMBER	QTY	PACKING SET (R10105)	REPAIR KIT (R10104)
1	HEAD	11-6092A001	1		
2	BUMPER	11-5012N000	1		
3	O-RING	P11000-214	2	X	X
4	BUMPER	11-5057P000	1		X
5	O-RING	P11000-144	4		
6	SEAL-DRY	D10684	1		X
7	O-RING	P11000-135	1	X	X
8	O-RING	P11003-137	2	X	X
9	O-RING	P11000-231	1	X	X
10	SPRING	11-5005M002	1		
11	PISTON - APA	D10817	1		
12	RETAINING RING	P10263-193	1		X
13	SLEEVE - APA	D10263	1		
14	BEARING ASSEMBLY	11-5047N000	1		
15	RETAINING RING	12-R262S000	1		X
16	O-RING	P11000-261	1	X	X
17	O-RING	P11000-223	1	X	X

AIR CHECK ASSEMBLY 11-6032X403





AIR CHECK ASSEMBLY 11-6032X403			
ITEM	DESCRIPTION	PART NUMBER	QTY
1	NUT	12-2104A4D08	1
2	RETAINER	11-5039S000	1
3	WASHER	11-5043N000	1
4	VALVE BODY	11-5171X001	1
5	SPRING	11-5015M000	1
6	O-RING	P11000-111	1
7	WASHER	11-5025N403	1
8	SCREW	11-5056A000	1

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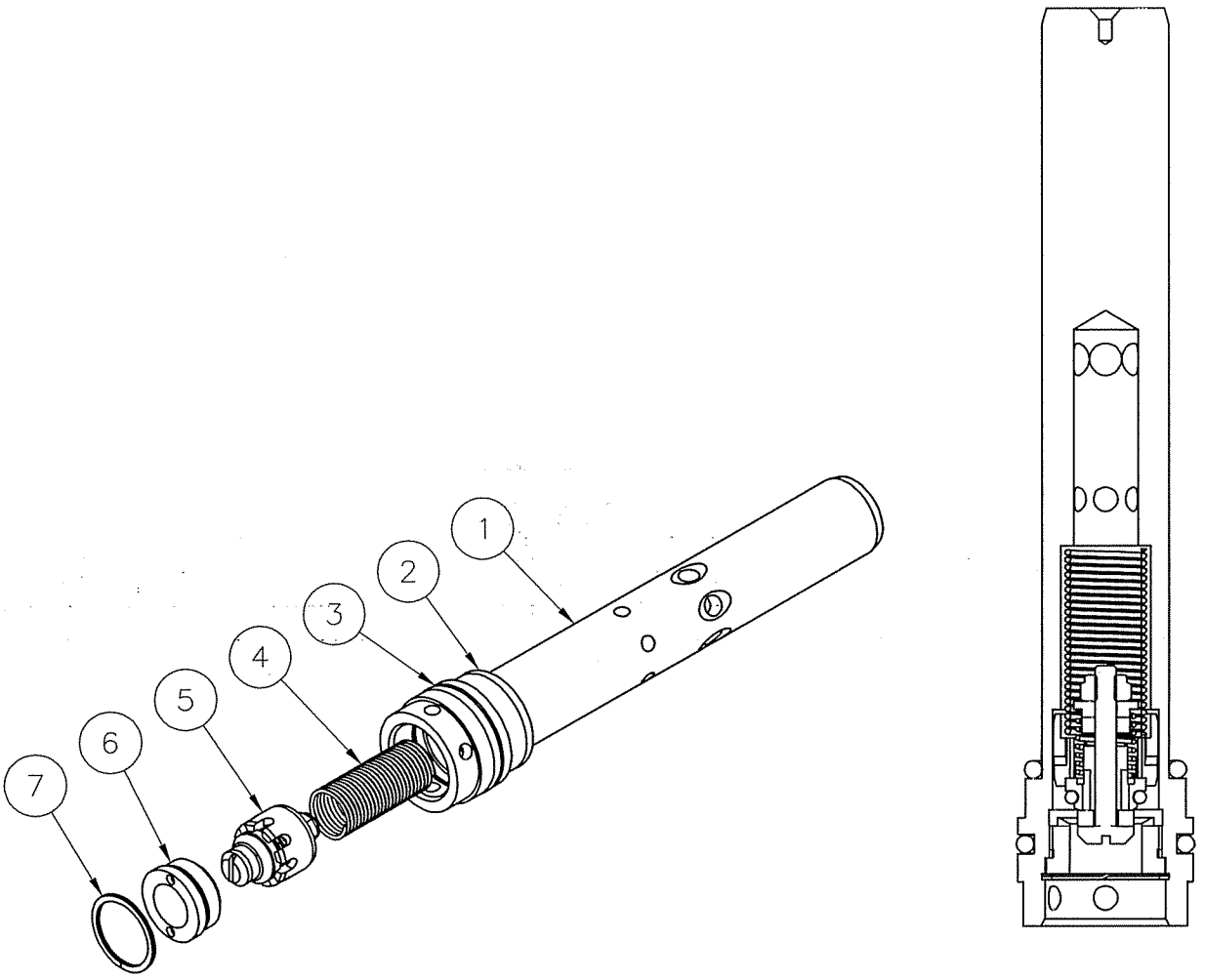
PILOT VALVE ASSEMBLY 11-6027A000

(Sheet 1 of 1) REV.16MAY02,D MACH



PILOT VALVE ASSEMBLY 11-6027A000					
ITEM	DESCRIPTION	PART NUMBER	QTY	PACKING SET (R10105)	REPAIR KIT (R10104)
1	VALVE BODY	11-6023A000	1		
2	O-RING	P11000-214	1	X	X
3	O-RING	P11000-216	1	X	X
4	SPRING	11-5016M001	1		X
5	AIR CHECK ASSY.	11-6032X403	1		X
6	SEAT	11-5024A403	1		
7	RETAINING RING	12-R093S000	1		X

NOTE: AIR MOTOR PACKING SET (R10105) ALSO INCLUDES AN O-RING (P11000-111) - USED ON AIR CHECK ASSEMBLY (11-6032X403).

OPERATING INSTRUCTIONS FOR P-SERIES HYDROSTATIC TEST PUMP

INTRODUCTION

The P-Series Hydrostatic Test Pump is designed to supply high pressure water for hydrostatic testing utilizing 25 - 125 psi compressed air to drive the pump. The pump is supplied with a quick connect terminating with male 3/8 NPT for connecting to the compressed air supply, a valve assembly terminating with a female 3/8 NPT for connecting with the unit under test.

HYDRO PUMP SET UP

NOTE: To avoid contamination of internal pump components, a water strainer and air filter should be installed in-line with the water and air supply hoses.

1. Connect the Water Inlet Valve to the water supply hose. Make sure the valve is in the "OFF" position (valve handle perpendicular to line). Turn on the water supply.

2. Connect the air supply to the air inlet quick connect coupling.

3. Connect the unit to be pressure tested to the high pressure hose assembly using the male 3/8 NPT fitting. Make sure all connections are rated for the pressure being applied.

4. Make sure the Pump Control Valve is in the "TEST" position and the regulator is turned fully counterclockwise.

5. Using the quick connect fittings supplied, connect the Water Inlet Valve to the water inlet (marked WATER), the air inlet coupling to the air inlet (marked AIR), and the high pressure hose to the high pressure outlet (marked H.P. OUT) on the hydro pump panel.

PUMP OPERATING INSTRUCTIONS

1. Turn Pump Control Valve and H.P. Relief Valve to the "TEST" position and turn the regulator fully counterclockwise.

2. Verify that the connections for water supply, air supply and unit to be tested are completed as described in Hydro Pump Set Up.

3. Open the Water Inlet Valve introducing water to the system.

4. Bleed/vent all air and/or gases from the system by opening fittings located at the highest points in the test set-up where air can become trapped. Allow water to continue to flow from these fittings until it is free from air, re-tighten all fittings.

   WARNING! COMPRESSED AIR IS VERY DANGEROUS UNDER HIGH PRESSURE. TAKE ALL PRECAUTIONS TO THOROUGHLY BLEED ALL THE AIR FROM THE SYSTEM BEFORE PRESSURE IS INTRODUCED.

5. Turn the Pump Control Valve to the "PUMP" position and slowly adjust the regulator clockwise until the desired test pressure is reached on the pressure gauge.

   WARNING! STAND AT SAFE DISTANCE FROM ANY VESSEL BEING TESTED.

6. Turn Pump Control Valve to the "TEST" position when the desired test pressure has been reached. Observe the pressure gauge for a drop in pressure, which would indicate a leak.

7. After testing is complete, turn the Water Inlet Control Valve to the closed position, and bleed all system pressure by turning the H.P. Relief Valve to the “H.P. RELIEF” position. Water will drain from the back of the pump.

8. Turn regulator fully counterclockwise to adjust pressure setting of pump to zero.

9. Disconnect the unit and connect the next unit to be tested to the high pressure hose.

10. Repeat steps 1 through 9 until all assemblies have been tested.

NOTE: For rapid testing using the same test pressure on each part, leave the regulator adjusted to the desired test pressure. When the Pump Control Valve is then turned to the “PUMP” position, the pump will then pressure the system to the last setting.

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.
In USA and Canada: tel: 800-355-7044, fax: 215-721-1101, e-mail: info@expansionseal.com
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On the Internet: www.expansionseal.com

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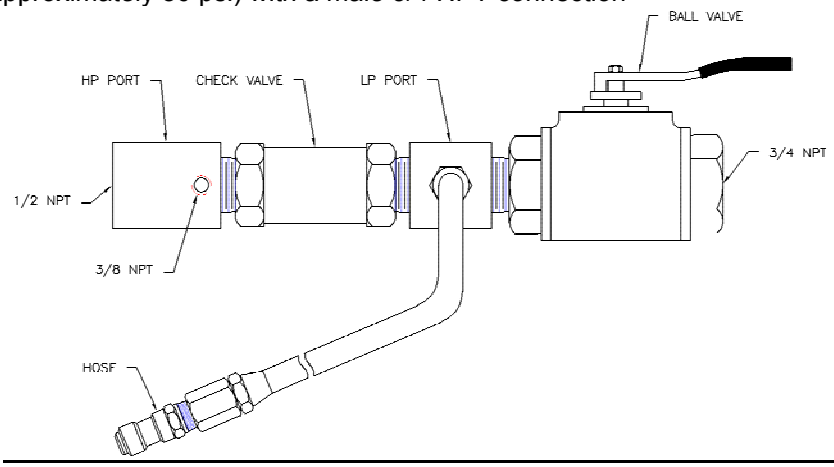
OPERATING INSTRUCTIONS
HIGH FLOW OPTION FOR THE PORTABLE HYDROSTATIC TEST PUMP

DESCRIPTION
The High Flow Option Assembly for the P-Series Hydrostatic Test Pump is used to speed the vessel filling process when a large volume of water is required for testing. The pump and a standard water supply can run concurrently, or just the water supply to fill the vessel.

EQUIPMENT REQUIRED

P-Series Hydrostatic Test Pump
High Flow Option Assembly PSR-0003
Standard water supply (approximately 50 psi) with a male 3/4 NPT connection



HIGH FLOW OPTION ASSEMBLY

ASSEMBLY INSTRUCTIONS

1. Attach a Quick Connect to HP port on High Flow option, 3/8 npt. Assemble onto pump at “HP out”.
2. Connect water supply to Ball valve on High flow option, 3/4 npt. The valve should be closed.
3. Connect the hose attached to the LP port on High Flow option to the “water inlet” on the pump.
4. Connect the hose supplied with the pump to the HP port on High Flow option, 1/2 npt. Adapter 1/2m-3/8f is required. Connect to vessel to be tested.

NOTE: INSURE ALL CONNECTIONS ARE LEAK TIGHT

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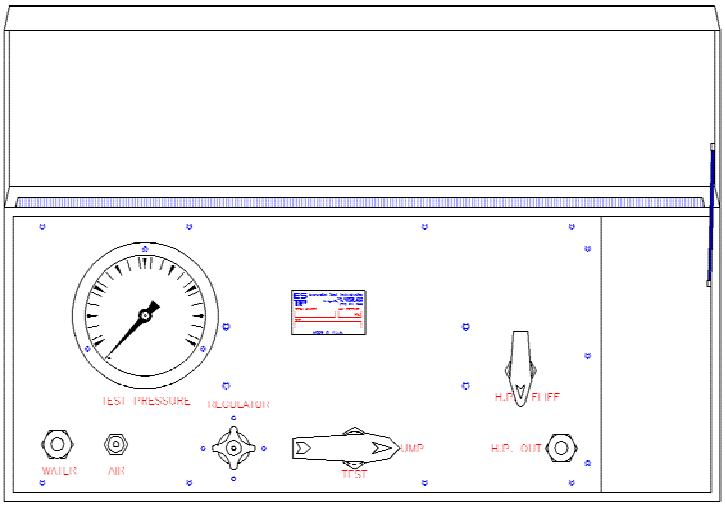

VESSEL FILLING AND TESTING INSTRUCTIONS

1. Turn the regulator fully counterclockwise.

2. Turn valve on pump to “test” position. Turn the HP relief valve to the “closed” position.

3. Connect compressed air supply to the quick connect fitting on pump panel marked “AIR”.

4. Fill the vessel to be tested with water by opening the Ball valve on the High Flow option. Air must be bled from the system at this time by opening pressure fitting(s) at the highest point(s) in the set-up and allow water to drain from the fittings until all air is excluded. Re-tighten all fittings after air is thoroughly bled.

CAUTION: MAKE SURE ALL AIR HAS BEEN BLED FROM THE SYSTEM BEFORE APPLYING TEST PRESSURE.

5. Begin hydrostatic testing by turning the valve on the pump to “PUMP”, and slowly adjust the pressure regulator clockwise to achieve the desired test pressure.

CAUTION: MAKE SURE ALL GASES HAVE BEEN BLED FROM THE SYSTEM BEFORE TESTING. DO NOT STAND NEAR VESSEL WHILE UNDER PRESSURE.

6. Turn the valve on the pump to the “TEST” position when the test pressure has been reached. Observe the pressure gage for a drop in pressure which would indicate a leak.

7. After testing is complete turn the Ball Valve on the High flow option to the closed position. Release pressure by turning the HP relief valve “H.P. RELIEF” position. Water will drain from the back of the pump.

8. Turn regulator fully counterclockwise to adjust pressure setting of pump to zero.

9. Disconnect the unit which has been tested and connect the next unit to be tested to the High Pressure Hose.

10. Repeat steps 1 through 9 until all assemblies have been tested.

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HIGH PRESSURE HAND PUMP
OPERATING INSTRUCTIONS

WARNING:

- ***PRESSURE TESTING IS INHERENTLY DANGEROUS. STRICT ADHERENCE TO THESE OPERATING INSTRUCTIONS AND INDUSTRY SAFETY PRACTICES COULD PREVENT INJURY TO PERSONNEL***
- ***ALL PERSONNEL MUST BE CLEAR OF TEST AREA WHEN PRESSURE TESTING FOR SAFETY, AN INCOMPRESSIBLE LIQUID SUCH AS WATER SHOULD BE USED AS THE TEST MEDIUM.***

PRIOR TO USE:

- Ensure the reservoir is filled with either water or oil.
- Ensure a suitable high pressure hose is connected to the outlet connection labeled FLUID OUT on the backside of the pump.
- Ensure the PRESSURE RELEASE valve is closed (turn clockwise).

1. Remove the handle from the storage rings and place on the LOW PRESSURE pump.

2. With the PRESSURE RELEASE closed, pump the LOW PRESSURE pump to remove any residual air in the system.

3. Connect the outlet hose to the test object, ensuring all connections are leak-tight.

4. After all appropriate connections have been made proceed with pumping the LOW PRESSURE pump, until either the gauge reads 1,000 PSI or until there is high resistance in the handle.

5a. If a higher test pressure is required, move the handle from the LOW PRESSURE pump to the HIGH PRESSURE pump.

5b. Continue to pump until the gauge reads the desired test pressure or 10,000 PSI max.

6. Upon completion of testing, release the pressure by slowly opening the PRESSURE RELEASE valve (turn counter-clockwise) until the gauge reads 0 PSI.

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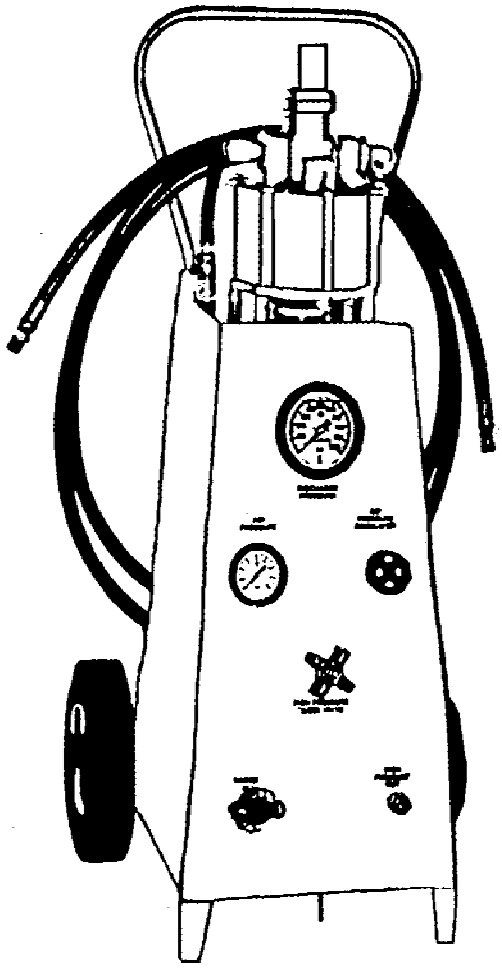
OPERATING INSTRUCTIONS & SERVICE MANUAL
BLUE MAX II HYDROSTATIC TEST PUMP



EFFICIENT, EASY OPERATION

- Air operated pump
- Wide range of pressures and volumes
- Easy to operate controls
- Output pressure regulation control

PORTABLE

- Lightweight design
- One person operation
- Low center of gravity for stability
- Semi-pneumatic tires

LOW MAINTENANCE

- Mounted regulator, lubricator
- Glycerin filled test gauge
- Water inlet filter

ENCLOSED CABINET

- Safer operation
- Quiet design
- Protection against component abuse and damage
- Convenient control location

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FEATURES

- Air powered pump in selection of pressures and volumes
- Air input regulator and lubricator
- Air pressure gauge
- Test pressure gauge, glycerin filled
- Water filter
- High pressure system bleed valve
- High pressure test hose
- Heavy duty enclosure with handle
- Semi-pneumatic tires
- Operation instructions printed on pump

PERFORMANCE DATA

MODEL NO	MAXIMUM PRESSURE		VOLUME @ 100CPM	PRESSURE RATIO	*MAXIMUM CFM REQUIRED	MAXIMUM AIR REQUIRED
	PSI	BAR				
BMX2-1000	1000	69	8.6 GPM	10:1	56 CFM	100 PSI
BMX2-3600	3600	247	2.6 GPM	36:1	56 CFM	100 PSI
BMX2-10000	10000	686	1 GPM	97:1	56 CFM	100 PSI

* Total required CFM to produce rated flow at maximum pump pressure. This is relevant only when the system is used for continuous injection at the maximum rated pressure. Normal testing requires much less CFM to begin with and falls to 0 at stall test pressure.

WEIGHT/DIMENSIONS

Length	Width	Height	Approx. Shipping Weight
19"	21"	44"	85lbs

OTHER PRESSURES AND VOLUMES AVAILABLE UPON REQUEST. CONTACT FACTORY FOR DETAILS.
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

OPERATING INSTRUCTIONS

CAUTION: READ INSTRUCTIONS BEFORE OPERATING THIS PUMP

TO SET UP PUMP:

1. Before use, verify adequate oil exists in Air Lubricator Reservoir on back of pump. If necessary fill with clean hydraulic oil; ASTM Grade 215, ISO Grade 46 or equivalent.

2. Close air valve (Rear of Pump), See Figure 1.

3. Connect input air supply (120 psi maximum) and input water supply to inlet connections on pump.

4. Connect high-pressure hose to high-pressure outlet pump. See Figure 2.

5. Open high-pressure bleed valve by rotating handle counter-clockwise. Bleed air from pump by opening air valve slightly and running until pump cycles for approximately five seconds.

6. Turn air off and close high-pressure bleed valve completely.

WARNING! NEVER LOOSEN ANY CONNECTION UNTIL YOU ARE ABSOLUTELY CERTAIN ALL PRESSURE HAS BEEN RELIEVED FROM THE SYSTEM.

METHOD OF HYDROTEST:

NOTE: When testing small vessels, desired pressure will be attained quickly.

1. Make appropriate connections to item being tested.

2. Turn air pressure regulator knob fully counter-clockwise

3. Open air valve (In back of Pump), turn air pressure regulator knob clockwise slightly until pump begins to cycle and then stalls

4. Gradually increase air pressure by rotating air pressure regulator clockwise until pump stalls at desired test pressure.

5. To release pressure, open the high-pressure bleed valve by rotating counter-clockwise.

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FIGURE 2

FRONT PANEL

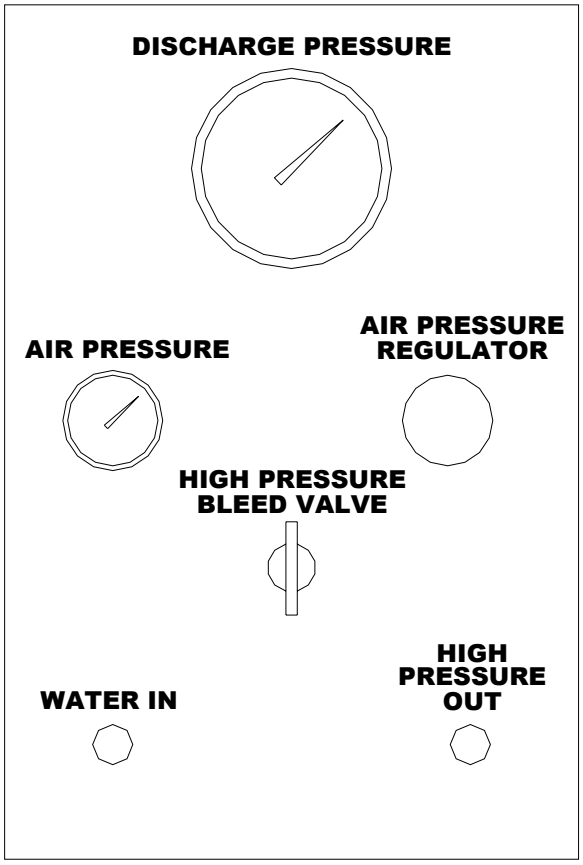
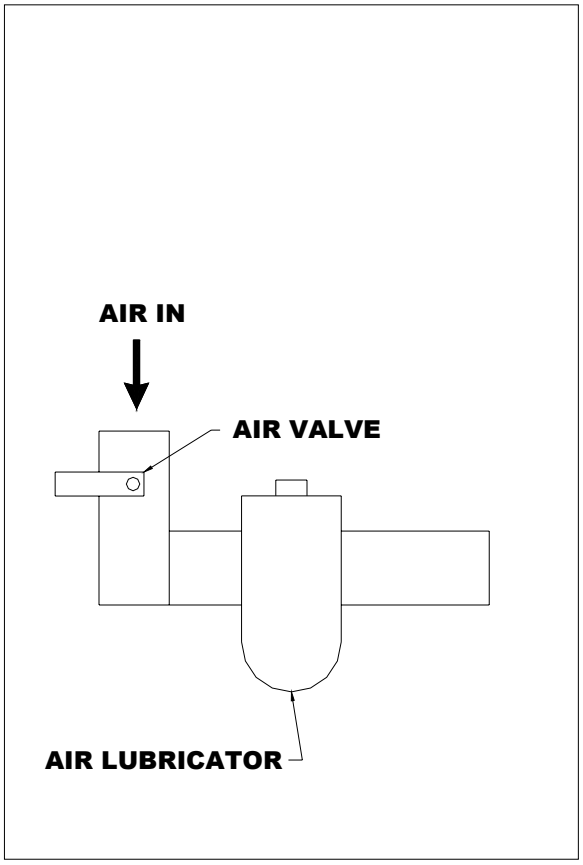


FIGURE 1

REAR PANEL



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SERVICING INSTRUCTIONS

1. TO DISASSEMBLE THE AIR MOTOR – Refer to Table 1 for Parts List and Part Numbers and cross section of the pump shown in Figure 3.

   A. Remove the (8) 3/8" bolts, Items #16 & 17, that clamp the Air Cylinder, Item #6, between the Head Casting, Item #22, and the Air Cylinder End, Item #3. Remove the Head by tapping on a fitting screwed into either the "Air In" or "Air Out" ports with a soft hammer.

   B. Remove the Retaining Ring, Item #13, from the bottom of the Air Piston, Item #4, and remove the Hydraulic Piston. The Pilot Valve Assembly, Item #20, may then be pushed out through the bottom of the Air Piston.

   C. Remove the Retaining Ring, Item #14, from the Head Assembly. Remove the Bearing Assembly, Item #7, by lifting or prying it out with a hammer handle or similar tool. The Air Piston Actuating Valve (part of Item #1, Valve Assembly) may also be removed at this time. The Bearing Assembly has a molded rubber seat and should be replaced if worn or damaged. The O-Ring, Item #8, in the Bearing Assembly, the O-Ring, Item #11, in the upper part of the Air Piston Actuating Valve, and the O-Ring on the Pilot Valve Assembly head should be replaced as a routine matter while the pump is disassembled, as they are especially important for maximum performance.

   D. The Head has a Rubber Bumper, Item #15, inserted in the upper portion of the body. This acts as an air seal and also a cushion for the Air Piston Actuating Valve. If worn or damaged, it should be replaced.

   NOTE: When worn or damaged, the Air Piston Actuating Valve and the Sleeve in which it operates are supplied as a Valve Assembly, Part #PI001 (See Parts List). The Sleeve may be removed from the Head Casting by means of an internal puller engaging the slots in the Sleeve. Install a new set of O-Rings, Part #PI0021 (4 required and included with Valve Assembly when ordering as a replacement part). Be sure to coat the O-Rings and the Sleeve O.D. with an O-Ring lubricant to avoid possibility of damage to the O-Rings when installing the new sleeve.

CAUTION: DO NOT REMOVE THE SLEEVE FROM THE HEAD CASTING UNLESS REPLACEMENT IS TO BE MADE. THE VALVE ASSEMBLY IS PRECISION GROUND AND HONED TO VERY CLOSE TOLERANCES AND THE SLEEVE MAY BE DAMAGED WHEN REMOVED FROM THE HEAD CASTING.

2. REPAIRING THE PILOT VALVE ASSEMBLY – The Pilot Valve Assembly, Item #20, has an Air Check Assembly, Part #PI025, located on the lower end. Remove the Retaining Ring, Part #PI024, which locks the Valve Seat, Part #PI027, in place and remove the Valve Seat with a spanner wrench. The Air Check Assembly and the Spring, Part #PI026, will then drop out and may be inspected for wear and damage. Replace the springs and worn parts as required. If adjustment is required in the Air Check Assembly, the assembly should be screwed together until the component parts are drawn up just snugly with no travel in the bolt assembly and then the nut should be backed off ONE COMPLETE TURN. When the assembly adjustment has been done correctly, the valve will open approximately 1/32 inch when the bolt assembly is depressed to open the valve. Deform the threads on the end on the Bolt after completion of assembly to ensure the Self Locking Nut being in proper position.

   NOTE: Both the O.D. and I.D. of the stem of the Air Piston, Item #4, must be free from wear, scoring, or other damage as they must form a leak tight seal with the contacting O-Ring. Satisfactory performance will not be obtained where air leakage may occur between the Piston stem and the O-Rings. The O-Ring, Item #12, may also be inspected at this time. Replace if necessary.

3. HYDRAULIC CYLINDER PACKING REPLACEMENT (EXCEPT BMX2-1000) – Refer to Figure 4 and Table 2. It is not necessary to dismantle the Air Motor. Proceed as follows. Remove the Motor Pump Assembly and loosen the Set Screw in the Air Cylinder End, Item #31. Unscrew the Air Motor from the Hydraulic Cylinder. The Hydraulic Piston will be removed with the Air Motor, permitting convenient replacement of the packing in the Hydraulic Cylinder. Replace

the Backup Rings and the O-Rings. When installing the new packing, be sure that the Backup Rings and the O-Rings are properly in place. If they are damaged or not installed correctly, the O-Rings will malfunction, with resultant loss of pressure and packing failure. When replacing the Air Motor, install a new Gasket, Item #30, and ensure that the Hydraulic Piston is in proper alignment before screwing the Air Motor into position.

4. The Hydraulic Piston has a Rubber Bumper, Item #34, in the head. If replacement is required remove the Retainer, Item #33, with a spanner wrench and install new Rubber Bumper and Washer, Item #32. Apply thread sealant to the Retainer threads when replacing and tighten securely, but not to exceed 4 ft-lbs of torque.

5. REPAIRING OR REPLACING THE HYDRAULIC CHECK VALVES – These valves should not give any trouble unless foreign matter such as dirt or grit is present in the fluid supply. If a leak develops, remove the check valves from the Hydraulic Cylinder. Remove the O-Ring and replace with a new one. Inspect the ball seat in the Valve while the O-Ring is removed. If it shows any indication of wear or damage, the entire Valve Assembly should be replaced. Refer to Parts List for part numbers and cross section of the Valves.

6. When operations described in Paragraphs 1 to 5 inclusive have been completed, the entire unit will have been dismantled and all parts inspected for wear and damage. It is especially important that all parts that operate in O-Rings or Packing be free from pits, scoring or any other defects that may cause excessively rapid wear of O-Rings and Packing. As leaks will develop almost immediately under these conditions and satisfactory performance will not result.

7. REASSEMBLING THE PUMP – Reverse the procedure used for dismantling, ensuring that all Retaining Rings are properly in place and that no O-Rings have been damaged in reassembly.

   IMPORTANT: When reassembling the Air Motor, ensure that the Air Cylinder, Part #PI006, is in proper position against the flanges on the Pump Head and the Air Cylinder End before tightening the bolts that clamp the Air Motor together. Use a soft hammer to position the flanges tightly against the Air Cylinder Ends BEFORE tightening the bolts. Failure to do so may result in over-tightening the bolts initially and when the bolts on the opposite side are drawn up this may result in the bolt lugs being broken or twisted off when the assembly is drawn down into position. Bolts should be secured lightly at first then drawn up in sequence until uniform torque has been applied to all of the bolts around the perimeter of the pump.

TROUBLESHOOTING GUIDE:

8. PUMP NOT RUNNING PROPERLY – If for any reason the pump does not run properly, look for one of the following causes:

   A. If the pump appears to be short stroking and running too fast without pumping properly, it usually indicates that the Air Check Assembly is not working properly. (See Paragraph 2 for correct procedure.)

   B. Loss of pressure may be caused by one of two reasons, the Hydraulic Check Valves have developed a leaky condition or the fluid is bleeding past the Packing in the Hydraulic Cylinder. (See Paragraphs 3, 4, and 5 for repair instructions.) Also check air pressure at pump inlet if hydraulic pressures fluctuate.

   C. Should the pump commence to run erratically and in a jerky manner after a period of time, it usually is an indication that a seizing action is taking place in the Hydraulic Piston and Cylinder Assembly. (See Paragraphs 1 and 3 for disassembly instructions.) This is usually caused by foreign matter such as alkali, dirt or grit being present in the fluid supply. If the Hydraulic Piston and Cylinder have not been damaged, a thorough cleaning will normally place the pump in operation again.

   D. For maximum flow volume, ensure that a sufficient flow of air is supplied to the pump. Hooking the pump up to a long run of relatively small pipe supplying air may cause slow operation.

   E. If an excessive amount of oil or water is coming through the pump air exhaust, check the following:

      i. Lubricating unit in the air supply is delivering too much oil. Adjust to about one drop of oil every 20 strokes of the pump.

      ii. The water being pumped may be leaking past the packing in the hydraulic cylinder into the Air Motor. (See paragraph 3 for correction procedure)

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FIGURE 3 - BMX II AIR MOTOR ASSEMBLY

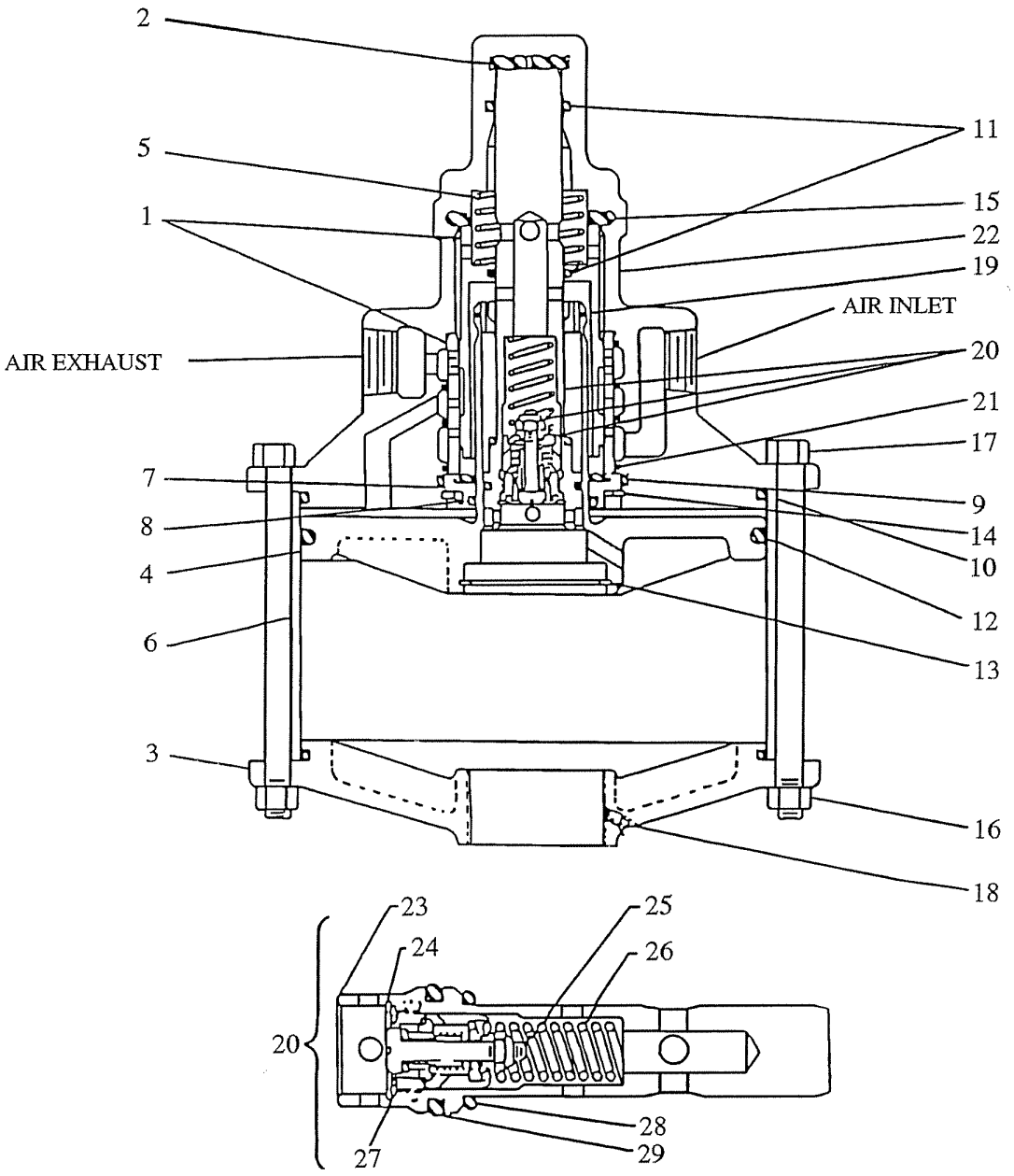

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TABLE 1 - BMX II AIR MOTOR ASSEMBLY PARTS LIST

ITEM NUMBER	NUMBER REQUIRED	PART NUMBER	DESCRIPTION
1	1	PI001	Valve Assembly
2	1	PI002	Bumper
3	1	PI003	End
4	1	PI004	Piston
5	1	PI005	Spring
6	1	PI006	Cylinder
7	1	PI007	Bearing Assembly
8*	1	PI008	O-Ring
9*	1	PI009	O-Ring
10*	1	PI010	O-Ring
11*	2	PI011	O-Ring
12*	1	PI012	O-Ring
13*	1	PI013	Retaining Ring
14	1	PI014	Retaining Ring
15*	1	PI015	Bumper Valve
16	8	PI016	Nut
17	8	PI017	Bolt
18	1	PI018	Set Screw
19*	1	PI019	O-Ring
20	1	PI020	Pilot Valve Assembly
21	4	PI021	O-Ring
22	1	PI022	Head
23	1	PI023	Valve
24	1	PI024	Retainer Ring
25*	1	PI025	Check Assembly
26*	1	PI026	Spring
27	1	PI027	Seat
28*	1	PI028	O-Ring
29*	1	PI029	O-Ring

*** INCLUDED IN FLUID END OVERHAUL KIT**

FIGURE 4 – BMX II HYDRAULIC CYLINDER DRAWING

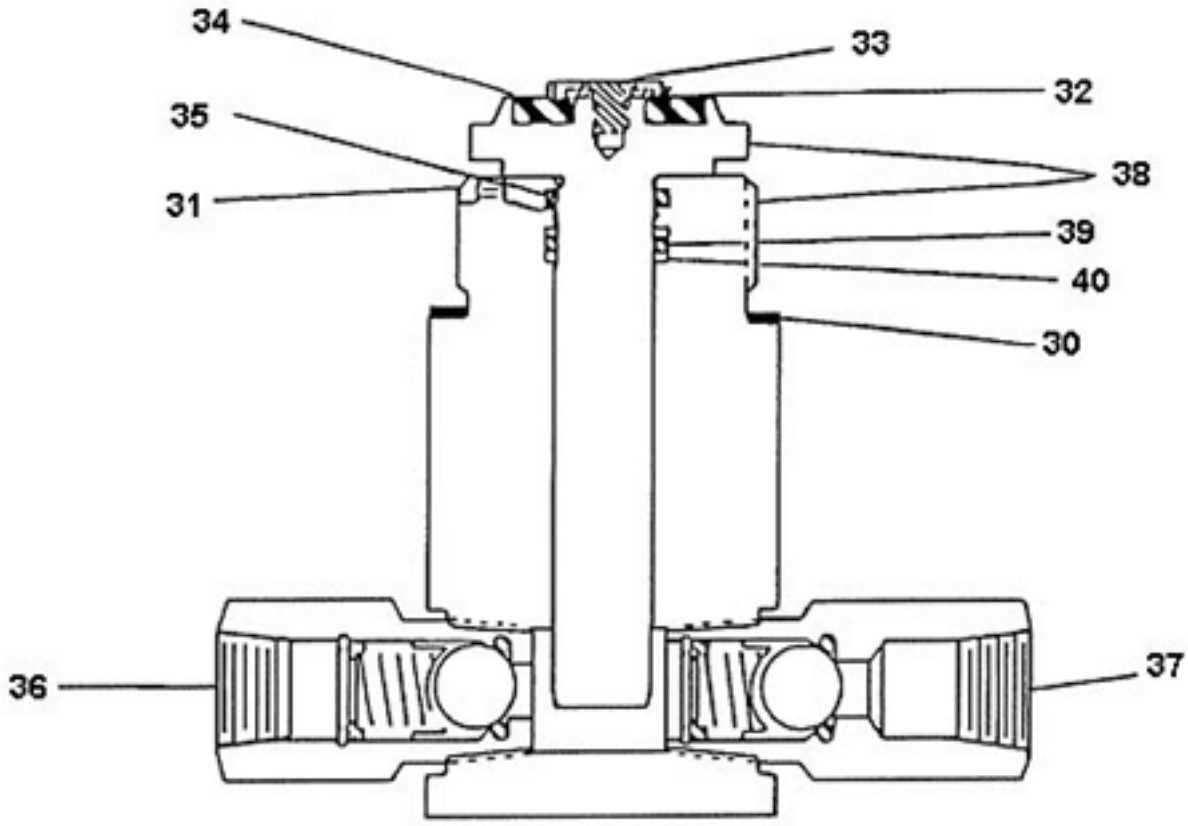

TABLE 2 – BMX II HYDRAULIC CYLINDER PARTS LIST

ITEM	QTY	3600	6000	10000	DESCRIPTION
30*	1	PI2016	PI2016	PI2016	Gasket
31	1	PI2017	PI2017	PI2017	Set Screw
32*	1	PI05514	PI05514	PI05514	Washer
33	1	PI05513	PI05513	PI05513	Retainer - Bumper
34*	1	PI05512	PI05512	PI05512	Bumper - Piston
35	1	PI2021	PI3021	PI5021	O-Ring - Teflon
36	1	PI2022	PI3022	PI3022	Valve Assy - Outlet
37	1	PI2023	PI3023	PI3023	Valve Assy - Inlet
38	1	PI2024	PI3024	PI5024	Piston Cylinder Assy
39*	1	PI2025	PI3025	PI5025	O-Ring
40*	2	PI2026	PI3026	PI5026	Back-up
	1	PI2050	PI3050	PI15050	Overhaul Kit

*** INCLUDED IN OVERHAUL KIT**

OPERATING INSTRUCTIONS
BLUE MAX 3 HYDROSTATIC TEST PUMP

EFFICIENT, EASY OPERATION

- Air operated pump
- Wide range of pressures and volumes
- Easy to operate controls
- Output pressure regulation control
- High pressure system bleed valve
- High pressure test hose

PORTABLE

- Lightweight design
- One person operation
- Low center of gravity for stability
- Semi-pneumatic tires

LOW MAINTENANCE

- Mounted regulator, lubricator
- Test pressure gauge glycerin filled
- Air pressure gauge
- Water inlet filter

ENCLOSED CABINET

- Safer operation
- Quiet design
- Protection against component abuse and damage
- Convenient control location
- Heavy duty enclosure with handle

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PERFORMANCE DATA

MODEL NUMBER	MAXIMUM PRESSURE psi (bar)	CAPACITY AT 100 CPM GPM (LPS)	PRESSURE RATIO	* MAXIMUM SCFM (SCMH) REQUIRED	AIR PRESSURE REQUIRED psi (bar)
BMX3-1000	1000 (68.9)	8.60 (.65)	10:01	56 (95.1)	100 (6.9)
BMX3-3600	3600 (248.2)	2.60 (.20)	36:1	56 (95.1)	100 (6.9)
BMX3-10000	10000 (689.5)	1.00 (.08)	97:1	56 (95.1)	103 (7.1)
BMX3-10000-HF	10000 (689.5)	34 (2.58)	100:1	150 (254.9)	100 (6.9)

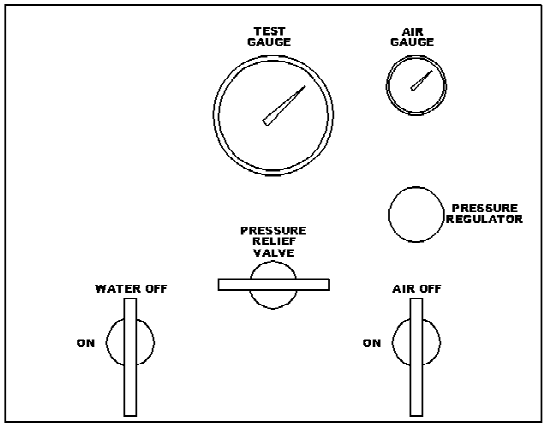
* Total required SCFM to produce rated flow at maximum pump pressure. This is relevant only when the system is used for continuous injection at the maximum rated pressure. Normal testing requires much less SCFM to begin with and falls to 0 at stall test pressure.

OTHER PRESSURES AND VOLUMES AVAILABLE UPON REQUEST. CONTACT FACTORY FOR DETAILS. SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

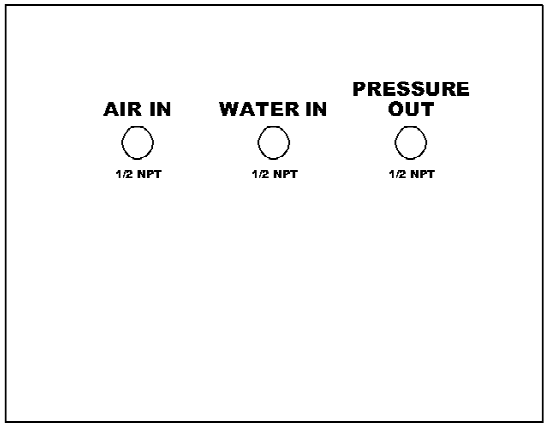
WEIGHT/DIMENSIONS

LENGTH in (mm)	WIDTH in (mm)	HEIGHT (NOT INCLUDING HANDLE) in (mm)	APPROX SHIPPING WEIGHT lbs (Kg)
14" (355.6)	16" (406.4)	36" (914.4)	150 (68.0)

FRONT PANEL



REAR PANEL



NOTE: REAR PANEL CONNECTIONS MAY BE LOCATED ON SIDES OF PUMPS

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OPERATING INSTRUCTIONS

CAUTION: READ INSTRUCTIONS BEFORE OPERATING THIS PUMP

TO SET UP PUMP: SEE FRONT AND REAR PANEL LAYOUTS ON PAGE 2

1. Close the Air and Water Valves by turning to the "OFF" position. Close the Pressure Relief Valve by turning clockwise. (Front panel)
2. Set the Regulator to "0" by pulling up and fully turning counter clockwise. (Front panel)
3. Connect input air supply (120 psi maximum) and input water supply to inlet connections on pump. (Rear panel)
4. Connect the high-pressure hose to the pressure out connection on pump, leak tight. (Rear panel)
5. Make appropriate leak tight connections to item being tested.
6. Turn Water valve to "ON" position. By turning counter-clockwise, open the Pressure Relief Valve to bleed air from pump for approximately ten seconds. (Front panel)
7. Close Pressure Relief Valve completely by turning clockwise. (Front panel)

WARNING! NEVER LOOSEN ANY CONNECTION UNTIL YOU ARE ABSOLUTELY CERTAIN ALL PRESSURE HAS BEEN RELIEVED FROM THE SYSTEM.

METHOD OF HYDROTEST:

NOTE: When testing small vessels, desired pressure will be attained quickly.

1. Confirm Regulator is set at "0" by pulling up and fully turning counter-clockwise.
2. Turn Air Valve to "ON" position. Turning the Regulator clockwise will start the pump. The pressure can be regulated by adjusting the Regulator clockwise to increase and counter-clockwise to decrease pressure. (Front panel)
3. When the test reaches the desired pressure, turn the Air Valve to the "OFF" position and push Regulator down. (Front panel)
4. Upon completion of the test, release the system pressure by opening the Pressure Relief Valve, counter-clockwise. (Front panel)
5. Turn the Water Valve to the "OFF" position and leave the Air Valve in the "OFF" position. Do not attempt to disconnect until all the water has been bleed out of pump.
6. Pull up on the Regulator and return the Air Gauge to the "0" position by turning counter-clockwise. (Front panel)

QUESTIONS? Contact EST Customer Service at any of the following locations with questions.
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EST Hydrostatic Test Pumps

P-Series Hydrostatic Test Pump

Blue Max II Portable Hydrostatic Test Pump

P-Series Test Pump

Blue Max II Test Pump

TÜV MANAGEMENT SERVICE ISO 9001

Accurate, Convenient, Efficient

P-Series Hydrostatic Test Pump

A self-contained pump used for testing tubes, pipes, or various pressure vessels.

- **All stainless steel high pressure side**
- **Easy to read 4" diameter pressure gauge**
- **Self contained in tool box :** Provides storage for hose, fittings, & plugs
- **Mating quick connect couplings:** Available for air inlet, water inlet, and high pressure outlet.
- **Test Pump control:** allows pump to continuously maintain pressure or shut-off to determine pressure drop.
- **Operating range:** Air supply: 25-125 psi (1.72-8.58 bar) Temperature: 30°-170°F.

Blue Max II Portable Hydrostatic Test Pump

A portable test pump used for testing tubes, pipes, or various pressure vessels.

- **Efficient, easy operation:** BMX2 has air operated pump, wide ranges of pressures and volumes, easy-to-operate controls, and output pressure regulation controls.
- **Portable:** Lightweight design, one man operation, low center of gravity for stability, semi-pneumatic tires
- **Low maintenance:** Mounted regulator/lubricator, glycerin filled test gauge, water inlet suction strainer
- **Enclosed cabinet:** Safer operation, quiet design, protection against component abuse and damage, convenient control location.

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SPECIALISTS IN TUBE TESTING, SLEEVING AND PLUGGING TECHNOLOGY — AN ISO-9001 REGISTERED COMPANY

DC-8064 • Rev 2 • 2/03

Web Address: www.expansionseal.com • E-Mail: info@expansionseal.com

P-Series Test Pump

Model Number	Maximum Outlet Pressure PSI	BAR	Open Flow Rate (GPM)	Flow Rate At 85% Rated Output (GPM)*
PSR-2300	2300	158	1.43	.65
PSR-7800	7800	535	.39	.22

Part Number	Description
PSR-0001	Inlet control valve assembly
PSR-0002	Pump rebuild kit
PSR-0003	High flow option
PSR-0004	1/2" diameter high pressure hose, 10 ft.

Length	Width	Height	Approximate Shipping Weight
24"	9-1/2"	10-1/2"	42 lbs.

Features

- Self lubricating air over water intensifier
- Lockable aluminum tool box
- Water supply connection
- Regulator to control inlet ai r supply
- High pressure bleed valve
- High pressure outlet

Blue Max II Test Pump

Model Number	Maximum Pressure PSI	BAR	Volume @ 100 CPM	Pressure Ratio	*Maximum CFM Required	Maximum Air Required
BMX2-1000	1000	69	8.6 gpm	10:1	56 CFM	100 psi
BMX2-3600	3600	247	2.6 gpm	36:1	56 CFM	100 psi
BMX2-10000	10000	686	1 gpm	97:1	56 CFM	100 psi

* Total required CFM to produce rated flow at maximum pump pressure. This is relevant only when the system is used for continuous injection at the maximum rated pressure. Normal testing applications require much less CFM to begin with and fall to (0) at stall test pressure.

Weight/Dimensions

Weight	Width	Height	Approx. Shipping Weight
19"	21"	44"	85 lbs.

Other pressures and volumes available upon request. Contact factory for details.

Features

- Air Powered pump in selection of pressures and volumes
- Air input regulator and lubricator
- Air pressure gauge
- Test pressure gauge, glycerin filled
- Water suction strainer with crow's foot connector
- High pressure system bleed valve
- High pressure test hose, 15 feet w/swivel
- Heavy duty enclosure with handle

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