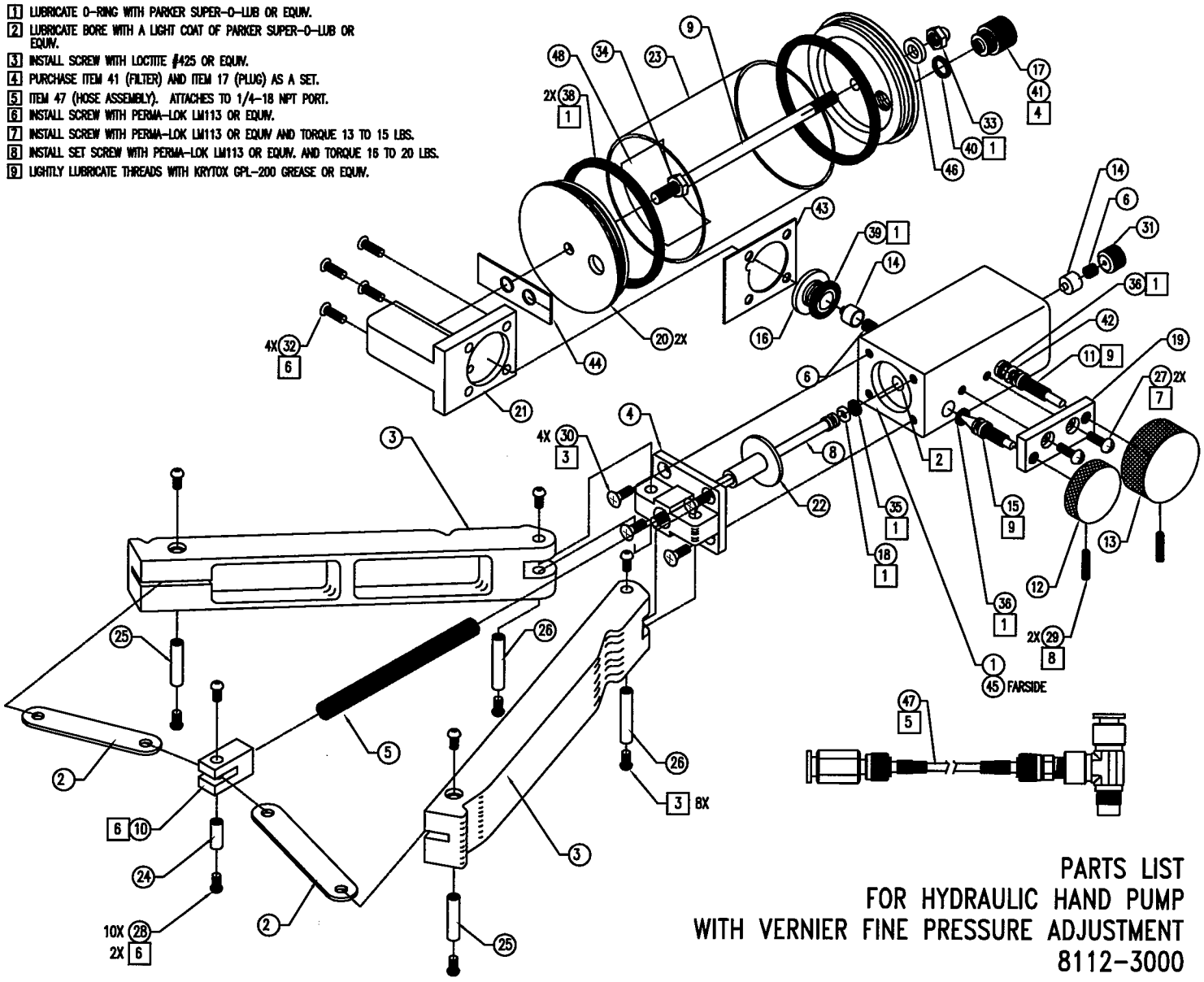
NOTES: UNLESS OTHERWISE SPECIFIED

1. LUBRICATE O-RING WITH PARKER SUPER-O-LUB OR EQUIV.
2. LUBRICATE BORE WITH A LIGHT COAT OF PARKER SUPER-O-LUB OR EQUIV.
3. INSTALL SCREW WITH LOCTITE #425 OR EQUIV.
4. PURCHASE ITEM 41 (FILTER) AND ITEM 17 (PLUG) AS A SET.
5. ITEM 47 (HOSE ASSEMBLY). ATTACHES TO 1/4-18 NPT PORT.
6. INSTALL SCREW WITH PERMA-LOK LM113 OR EQUIV.
7. INSTALL SCREW WITH PERMA-LOK LM113 OR EQUIV AND TORQUE 13 TO 15 LBS.
8. INSTALL SET SCREW WITH PERMA-LOK LM113 OR EQUIV. AND TORQUE 15 TO 20 LBS.
9. LIGHTLY LUBRICATE THREADS WITH KRYTOX GPL-200 GREASE OR EQUIV.



PARTS LIST
FOR HYDRAULIC HAND PUMP
WITH VERNIER FINE PRESSURE ADJUSTMENT
8112-3000

QTY.	ITEM NO.	PART NO.	DESCRIPTION
1	1	2016-0011	BODY, HYDRAULIC HAND PUMP
2	2	2112-0003	LINK, PNEUMATIC HAND PUMP
2	3	2084-0003-1	HANDLE, UNIVERSAL, HAND PUMP (MACHINED)
1	4	2011-0005-1	BASE, BODY PNEUMATIC HAND PUMP (MACHINED)
1	5	2161-0127	SPRING, RETURN
2	6	8105-134	SPRING - CHECK VALVE HYDRAULIC PUMP
	7		
1	8	2155-0032	SHAFT, HYDRAULIC HAND PUMP
1	9	2155-0033	RESERVOIR ROD
1	10	2205-0002	YOKE, HYDRAULIC HAND PUMP
1	11	2136-0016	PISTON, VERNIER HYDRAULIC HAND PUMP
1	12	2105-0013	KNOB, RELIEF VALVE PNEUMATIC HAND PUMP
1	13	2105-0015	KNOB, VERNIER HYDRAULIC HAND PUMP
1	14	2140-0002	CHECK VALVE
2	15	2190-0023	VALVE, NEEDLE HYDRAULIC HAND PUMP
1	16	2190-0026	VALVE PLUG HYDRAULIC HAND PUMP
1	17	2190-0027	RESERVOIR PLUG HYDRAULIC HAND PUMP
1	18	2128-0001-B38	ORING, BACKUP (FOR 2-005)
1	19	2137-0111	PLATE, VERNIER HYDRAULIC HAND PUMP
2	20	8105-117-1	RESERVOIR END PLATE
1	21	2120-0007	MANIFOLD, RESERVOIR HYDRAULIC HAND PUMP
1	22	2019-0032	BUSHING, HYDRAULIC HAND PUMP
1	23	8105-111	RESERVOIR CYLINDER
1	24	2135-0077-1	PIN, PIVOT

QTY.	ITEM NO.	PART NO.	DESCRIPTION
2	25	2135-0077-2	PIN, PIVOT
2	26	2135-0077-3	PIN, PIVOT
2	27	2154-0001-65	SCREW, PAN HD 6-32 X .38 LG.
10	28	2154-0001-46	SCREW, BUTTON HD 6-32 X 1/4 LG.
2	29	2154-0001-68	SCREW, SET 8-32 X .38 LG.
4	30	2154-0001-69	SCREW, 100° CSK HD 6-32 X .38 LG.
1	31	2154-0008	SCREW, SET, 3/8-24 X .312 LG. MODIFIED
4	32	2154-0001-71	SCREW, 100° CSK HD 6-32 X .50 LG.
1	33	2127-0041	CAP NUT, BRASS
1	34	2127-0042	NUT, 10-32 NYLON, BLACK
1	35	2128-0001-23	O-RING, SIZE 2-005 (VITON)
2	36	2128-0001-43	O-RING, SIZE 2-007 (VITON)
	37		
2	38	2128-0001-28	O-RING, SIZE 2-033 (VITON)
1	39	2128-0001-34	O-RING, SIZE 3-904 (VITON)
1	40	2128-0001-27	O-RING, SIZE 2-011 (VITON)
1	41	2062-0001-1	FILTER SLUG STANDARD FITTINGS
1	42	2128-0001-B37	ORING, BACKUP (FOR 2-007)
1	43	2074-0018	GASKET, MANIFOLD HYDRAULIC HAND PUMP (EPDM)
1	44	2074-0019	GASKET, RESERVOIR (EPDM)
1	45	2124-0073	IDENTIFICATION LABEL
1	46	2196-0096	WASHER, FIBER
1	47	4086-0017	HYDRAULIC HOSE ASSEMBLY
1	48	2124-0078	LABEL, HYDRAULIC HAND PUMP

8112-3000
PNEUMATIC HANDPUMP
With Vernier Fine Pressure Adjustment

The 3D Hand-Operated Calibration Unit is a compact, lightweight and portable hand-operated pressure source. When a 3D pressure gauge or Accu-Cal Plus Digital Gauge is added, the unit can be used to calibrate or check pressure measuring devices in the field. The hydraulic handpump is utilized for high pressure applications up to 3000 psig. The handpump is safe because no electrical power or high pressure bottles are required. The unit is completely assembled and ready to be used in the field. Calibration is quick and simple because the unit is taken to the pressure source is always ready to go to the calibration site. The handpump can be supplied with a 3D ¼% accuracy gauge or Accu-Cal Plus Digital Gauge (see order information for correct model number).

OPERATING INSTRUCTIONS

The Hydraulic Handpump provides a hydraulic pressure source from 1 to 3000 psig. A wide variety of pressure media may be utilized but distilled water is the preferred fluid. The seals are Viton and the only other non-metallic materials are plastic. Viscous oils should not be utilized. **CAUTION:** Hydrocarbon fluids should never be used in oxygen service applications.

1. Isolate device to be calibrated. **CAUTION:** Do not connect to high pressure sources. Safe operating procedures must be exercised to avoid personal injury and damage to the calibration system.
2. Remove the fill plug (item 17) and fill the reservoir (item 23) approximately ½ full. Select a fluid compatible with the system and the handpump. Don't allow the fluid level to drop to the bottom of the reservoir.
3. Care should be exercised to minimize the total system volume. 3D pressure gauges may be filled with fluid by removing the filter, filling the fitting and replacing the filter. Connect the master gauge to the top of the street tee and the hose, connected to the system to be calibrated, to the other port.
4. **NOTE:** Air in the system should be minimized because it can effect calibration and high pressure gasses can be dangerous. Adjust the vernier control (item 13) to the mid position and close the needle valve (item 12). Exercise the handles until a moderate pressure appears on the master gauge and open the needle valve. Repeat until bubbles are not seen in the reservoir.
5. Close the needle valve and squeeze the handles until the approximate desired pressure is reached. The volume control can be used to "fine tune" the pressure. Systems with large volume may require additional bleeding. Continue until all pressure points are calibrated. At high pressures, the handle force can be reduced if the handles are not allowed to open completely when squeezing.
6. Manipulation of the needle valve, vernier control and the handles can produce any pressure desired within the handpump operating range (0 to 3000 psi).
7. When the calibration is completed, open the needle valve to release the pressure. **CAUTION:** To prevent personal injury, the pressure must be reduced to zero before disconnecting any element of the system. Store the unit in a carrying case or another safe location. The handpump may be stored with the operating fluid in the reservoir. It is recommended that the fluid being utilized be identified so that another potential operator of the handpump will be so advised.

TROUBLE SHOOTING

If the pressure fails to increase:

a. Insure the needle valve is tightly closed.
b. Make sure there are no leaks in the system. Note that very small leaks can prevent pressurization.
c. Make sure the fluid level has not dropped below the manifold level.
d. Remove the master gauge and see if fluid rises in the street tee when the handles are exercised. If not, proceed to step e.
e. Remove the reservoir and the manifold (item 2). Remove the valve plug (item 16) and inspect the check valve and check valve spring for damage. Make sure the pressure port is not plugged. Reassemble and repeat step d. If not, proceed to step f.
f. Remove the street tee and remove the Nylon set screw (item 31). Remove and inspect the check valve and spring. Reassemble and repeat step d. If not, proceed to step g.
g. Remove the top two handle pivots (item 26) and the four screws (item 32) and the base (item 4). Remove the entire assembly and inspect the o-ring. Reassemble and repeat step d.

If desired pressure can't be maintained:

a. Insure the needle valve is tightly closed.
b. Make sure there are no leaks in the system.
c. Air may be trapped in the system and can be removed by following **OPERATING INSTRUCTION** number 4.

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