

BENTONITE LUBRICANT PUMP
B-114
B-500

OPERATING & MAINTENANCE
MANUAL

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INTRODUCTION

American Augers Bentonite Pumps are designed primarily for the boring and jacking contractor. This machine rapidly mixes dry, bagged bentonite into a slurry and pumps it to the casing head under pressure to reduce friction. Propeller assures fast, efficient mixing. With a low-cost, single operation, he can now lubricate and support his pipe during installation.

Indispensable in sandy soils, the Bentonite Pump makes any bore easier. It assures better line and grade, improved thrust capabilities, and speedier operation in sand or clay. It also restricts sloughing and caving, and prolongs equipment life.

On completion of an installation, the Bentonite Pump can also be employed to spray-wash construction equipment, eliminating the need for an expensive water-jet cleaner. The pump may also be used for pressure-testing water lines.

MAINTENANCE

1. Check engine and pump for oil levels. See manufacturers' specifications in Bentonite Pump Owner's Manual
2. Lubricate pump. Grease propeller housing every 5 hours.

PREPARATION

1. Locate the Bentonite Pump on the surface above the pit so that operator can see the casing as it is collared in the ground.
2. Secure the 1/2 inch water pipe to casing by direct tack-welding or with pipe saddle clamps welded on 5 foot centers. (If saddle clamps are used, the water pipe can be retrieved on completion of the bore.)
3. Flatten end of pipe at overcut band. Weld a piece of flat steel on an angle to protect the pipe end during the boring.
4. Bend any excess pipe near the machine to the right side of the pit until the pipe end strikes out clear of the casing, This allows the discharge hose to hang straight down. The pipe is straightened when a new section is added.
5. Connect discharge hose to water pipe.
6. Close valve, item 9 (See Figure A).
7. Fill tank to proper level with clean water.
8. MODEL B-500 only: Position intake tube approximately 1 inch below water level.

9. Start engine/electric motor.

10. MODEL B-500: Add Bentonite by pouring slowly into opening of intake tube. Repeat until proper amount has been added.

MODEL B-114: Add Bentonite by pouring slowly into mixing tank. Repeat until proper amount has been added.

1. ENGINE

2. SUCTION HOSE

3. SUCTION PORT

4. DISCHARGE PORT

5. PUMP

6. LINE PRESSURE GAUGE

7. DISCHARGE HOSE

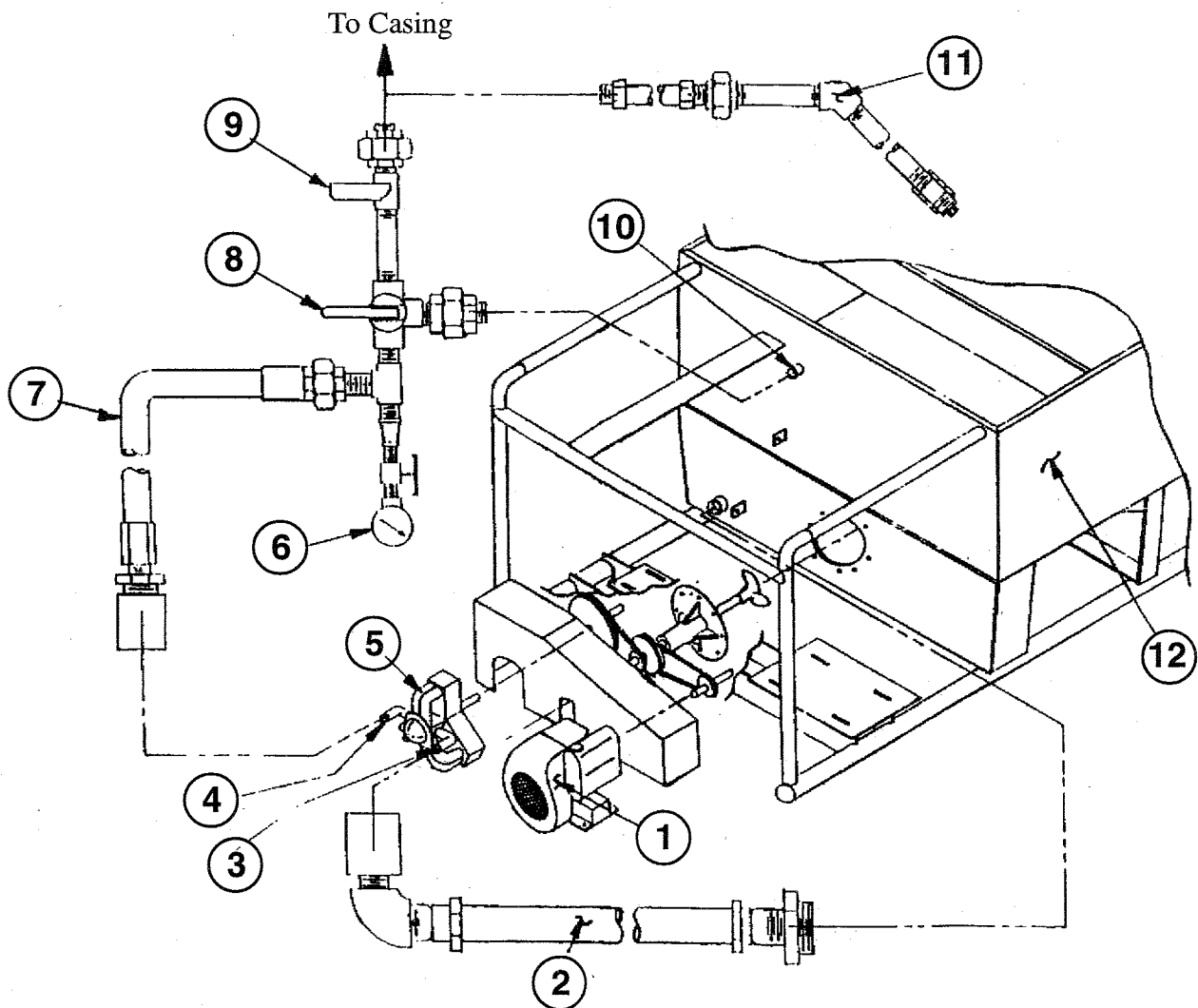
6. RELIEF/BYPASS VALVE

9. DISCHARGE SHUT OFF VALVE

10. BYPASS PORT

11. WAND

12. MIXING TANK



OPERATION

1. After proper consistency has been made, allow Bentonite to circulate for about 10-15 minutes.
2. Check all hose connections to stop leaks before they occur.
3. Open valve (Item 9), to allow flow to equipment.
4. Close Relief valve, Item 8 by moving handle to the UP position.

 **CAUTION**

Maximum System Pressure Not To Exceed 200 PSI.

NOTE: MODEL B -500: Bentonite usually comes in 50 pounds bags, so each batch takes 4 full bags. The 500 gallons of water and the 200 pounds of Bentonite will make a 5% gel concentration which is similar in consistency to soft jelly. This mix is adequate for most soil conditions. It will act as a good lubricant, and will help support the pipe in the hole. If soil conditions are extremely porous~ mostly gravel, etc., use a thicker gel.

MODEL B-114: Each batch takes one full bag. The 114 gallons of water and the 50 pounds of Bentonite will make a 5% gel concentration. (See above paragraph for additional notes.)

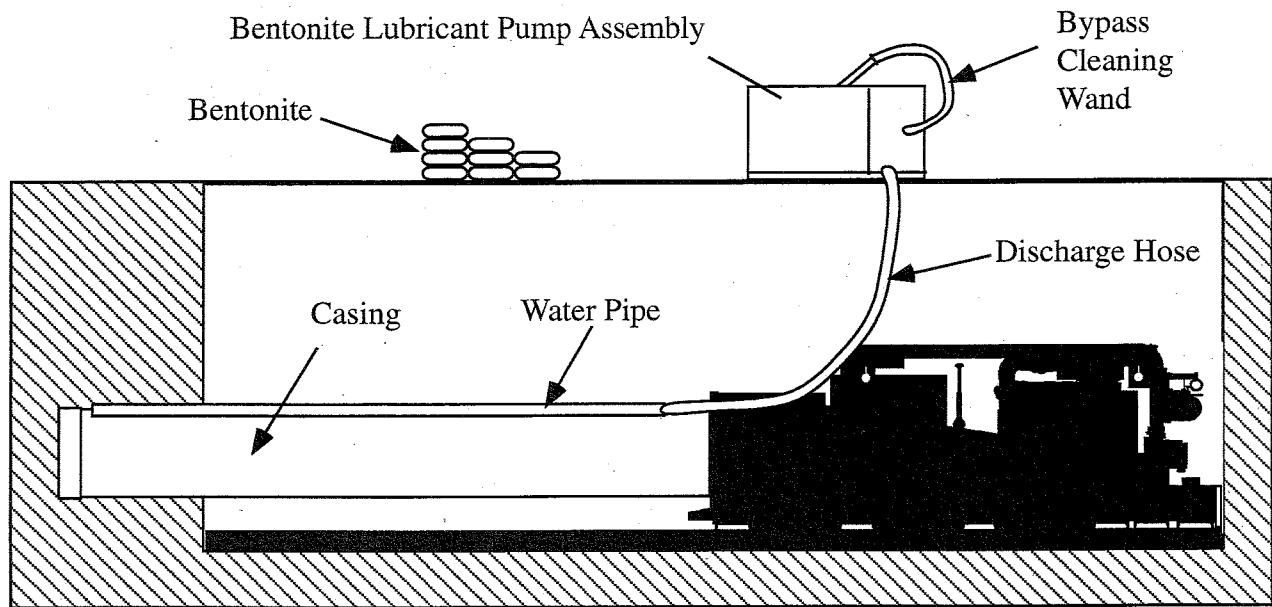
5. Pumping Slurry: Wait until the pipe is collared in the ground a few feet before starting to pump. Open Discharge Valve and close Bypass Valve. Stop pumping whenever the gel starts to come out around the pipe at the face of the approach pit.

NOTE: On a long crossing in good soil conditions where thrust is not a problem (at least for awhile), it may not be necessary~ to begin pumping until the pipe is buried in the ground a considerable distance.

6. Subsequent batches: by judging the level of the Bentonite in the tank, you can replenish the water and add the proper amount of Bentonite. (before doing this, however, you should open up the Relief Valve, Item 8, (Bypass to Tank), and close the system Valve. Item 9, before adding water or Bentonite.

NOTE: batch making can often be synchronized with welding or some other nonproductive job.

BASIC SET-UP SKETCH



CLEAN-UP

1. On completion of the crossing, the Bentonite Pump should be thoroughly washed and cleaned.
2. Remove the Drain Plug, and drain out any left in tank. Add CLEAN water and operate the necessary valves, while pumping, until the Pump is thoroughly cleaned.
3. Shut off water supply, pump system dry and drain all lines (open valves). See "Cold Weather Operation."

COLD WEATHER OPERATION

1. When necessary to operate in cold weather, add an adequate amount of denatured alcohol to prevent freezing (see antifreeze chart to determine temperature) to the water and allow it to circulate for a few moments, before adding Bentonite.
2. On completion of an operation, pump system dry, drain all lines (open valves) , and drain pump.

BENTONITE

The American Augers Bentonite Lubricant Pumps are designed for use with Quik-Gel Bentonite, marketed by Baroid Industrial Drilling Fluids, a Halliburton Company, Houston, Texas, tel: 281-871-4612). They have distributors throughout the world.

Quik-Gel contains a special additive. It is especially "slick" and it only requires one-third to one-half the amount to make a batch of gel , compared to other bentonite. To make a five (5) percent mix in the B-500 Pump it would require four hundred (400) pounds or more of other bentonite (viz. Mud Gel, KWK, Volclay, etc.)

Bentonite occupies a volume 12 to 15 times its dry bulk. On drying, it shrinks to its original volume. The swelling is reversible. It can be wetted (swelled) and dried (shrunk) an indefinite number of times, if the water used is fairly pure. Therefore, save any batches left over on completion of an operation. Store it in 55 gallon drums.

Always add Bentonite to water. Hot water reduces mix time.

Batch*	Lbs of Bentonite Per Batch For Different Concentrations						
	2%	3%	4%	5%	6%	7%	8%
Model B-500 500 U.S. Gal	87	120	160	200	244	286	328
	19.5	30	40	50	61	71.5	82

*Mixing capacity of each Pump using Baroid Quik Gel Bentonite

CLEAN EQUIPMENT

Close off all valves, set Relief Valve to 200 PSI. Open bypass Wand Valve and adjust water nozzle on end to desire spray. Caution use clean water to wash pump after each job.

WATER

It must be CLEAN. If taken from a creek, it must be screened. Chips and dirt will cause the Relief Valve to malfunction and pressure can not be developed. Also, salty or brackish water will not mix properly into the Bentonite slurry.

WARRANTY

American Augers Warranty applies.

Safety

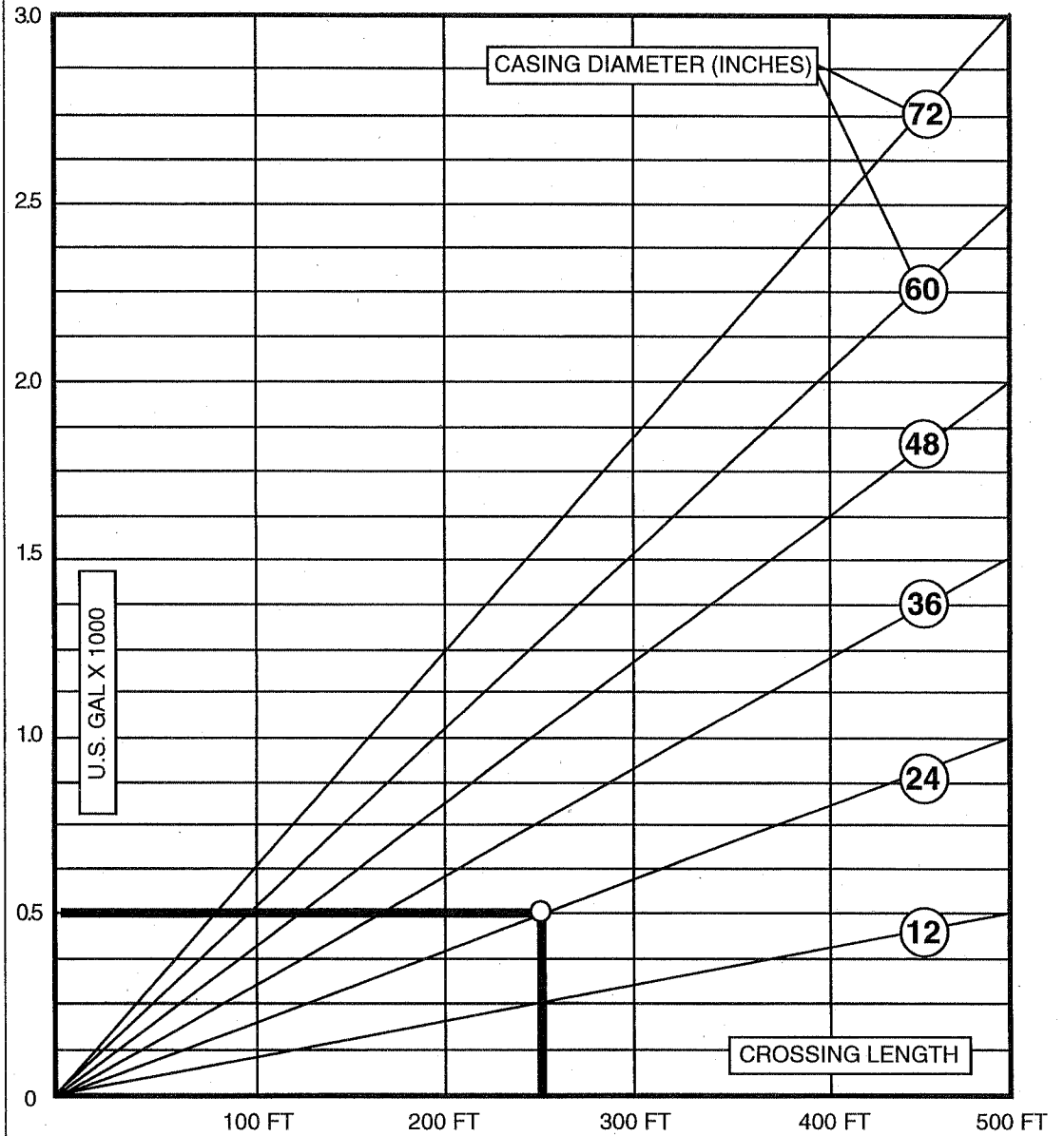
Safety glasses and masks should be worn all times when operating the Bentonite Lubricant Pump. Working pressures are high and even the best of Relief Valves have been know to malfunction.

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DIFFICULT PROBLEMS ARE ANSWERED IMMEDIATELY
IMPOSSIBLE ONES ONLY TAKE LONGER!

2174	1880	1594	1315	1041	773	510
2084	1801	1527	1260	997	740	488
1993	1723	1461	1205	954	708	467
1903	1645	1395	1151	910	676	446
1812	1567	1329	1096	867	644	425
1721	1489	1261	1041	823	611	403
1630	1410	1196	986	780	579	382
1539	1332	1129	931	737	547	361
1449	1253	1063	876	694	515	340
1359	1174	997	821	650	482	318
1268	1096	930	766	607	450	297
1178	1018	863	712	563	418	276
1087	940	797	657	520	386	255
997	861	730	602	476	353	233
906	783	664	547	433	321	212
816	705	597	493	390	289	191
725	627	531	438	347	257	170
634	549	464	383	303	225	148
543	470	398	328	260	193	127
453	392	332	274	216	161	106
362	313	266	219	173	129	85
272	235	199	164	129	96	63
182	157	133	110	86	64	42
91	78	66	55	43	32	2
0	0	0	0	0	0	0
8%	7%	6%	5%	4%	3%	2%

QUANTITY OF BENTONITE REQUIRED - POUNDS

PERCENT CONCENTRATION - BENTONITE



Find crossing length. Go up to casing diameter then left for total gallons required. Go further left for total pounds of Bentonite required for a desired concentration. Example: 250 foot bore, 24 inch diameter casing = 500 gallons of fluid, 219 pounds of bentonite for 5% concentration.

