

# MODEL 9700 & 9750 HO-PAC<sup>®</sup>

## OPERATING AND MAINTENANCE INSTRUCTIONS

### PARTS LIST AND WARRANTY

1. **GENERAL:** Your Model 9700 Ho-Pac is made up of the following major sub-assemblies:

- A. Top Mounting Bracket which connects to the excavator, supports the hydraulic hoses, and supports the rubber mounts.
- B. "Live Frame" made up of the base plate (Item 26), and the vibration generator (which includes such items as the eccentric (Item 5), bearings (Item 6), and hydraulic motor (Item 15). In operation, the "Live Frame" vibrates.
- C. Suspension System made up of the rubber mounts (Item 38), whose purpose it is to suspend and stabilize the "Live Frame" and also to isolate the vibration from the "Live Frame" to the excavator.

Installation kits are required to effect the installation of the Ho-Pac and excavator, and these kits are available for most models. Kits include all parts required for the mechanical and hydraulic hook up. Extra kits can be purchased so that one Ho-Pac may be used on several excavators.

2. **BEARINGS & LUBRICATION:** Bearing replacement, when required, should be done in the following manner. Remove bearing housing assembly from the main housing (Item 36) using, if necessary, back out screws in the tapped holes provided in the bearing housing (Item 12). Removal of the worn bearing can be accomplished by pushing a bar against the inner ring of the bearing (Item 6) from the back side of the bearing housing. The bar should be 2-7/16" diameter and have square cut ends.

The replacement bearing, which will have a press fit in the housing, should be forced in by pushing on the outer ring only. Use only Allied supplied bearings. They have been specifically selected to do the job.

Under normal operating conditions, bearings should be relubricated with a hand gun every 20 running hours. The preferred grease is: Texaco Molytex #2. The following greases have also been suggested as suitable for this application: Standard Oil — Rykon #2, Shell Oil — Cyprina #3, Gulf Oil — Gulf Crown #2, Mobile Oil — Mobilux #2.

3. **FASTENERS:** Adherence to the fundamental rules related to Ho-Pac fastener concept will contribute to long life of the machine. The concept has been proven by experience, and compromises could shorten life drastically.

Very simply, the concept is the use of highly preloaded fasteners which will keep the joined surfaces together without slippage and without need for retorquing for an unlimited period of time. The rules are as follows:

- A. Use only Allied fasteners. Cap screws, nuts, and washers have been specifically selected to do the job.
- B. Limit the number of reuses of fasteners to two or three times, especially those which screw into tapped holes.
- C. **IMPORTANT** — Tighten fasteners exactly as described. First clean mating surfaces, then draw the surfaces up **SNUG TIGHT** by exerting medium effort with wrench of normal length. Preload the fastener by turning screw head or nut 1/3 turn or 2 flats as shown in Figure 2; this will usually require a "cheater bar".

Check tightness of fasteners occasionally. Check carefully during the first day's use, especially at the outset.

(continued on page 4)

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P/N 102232

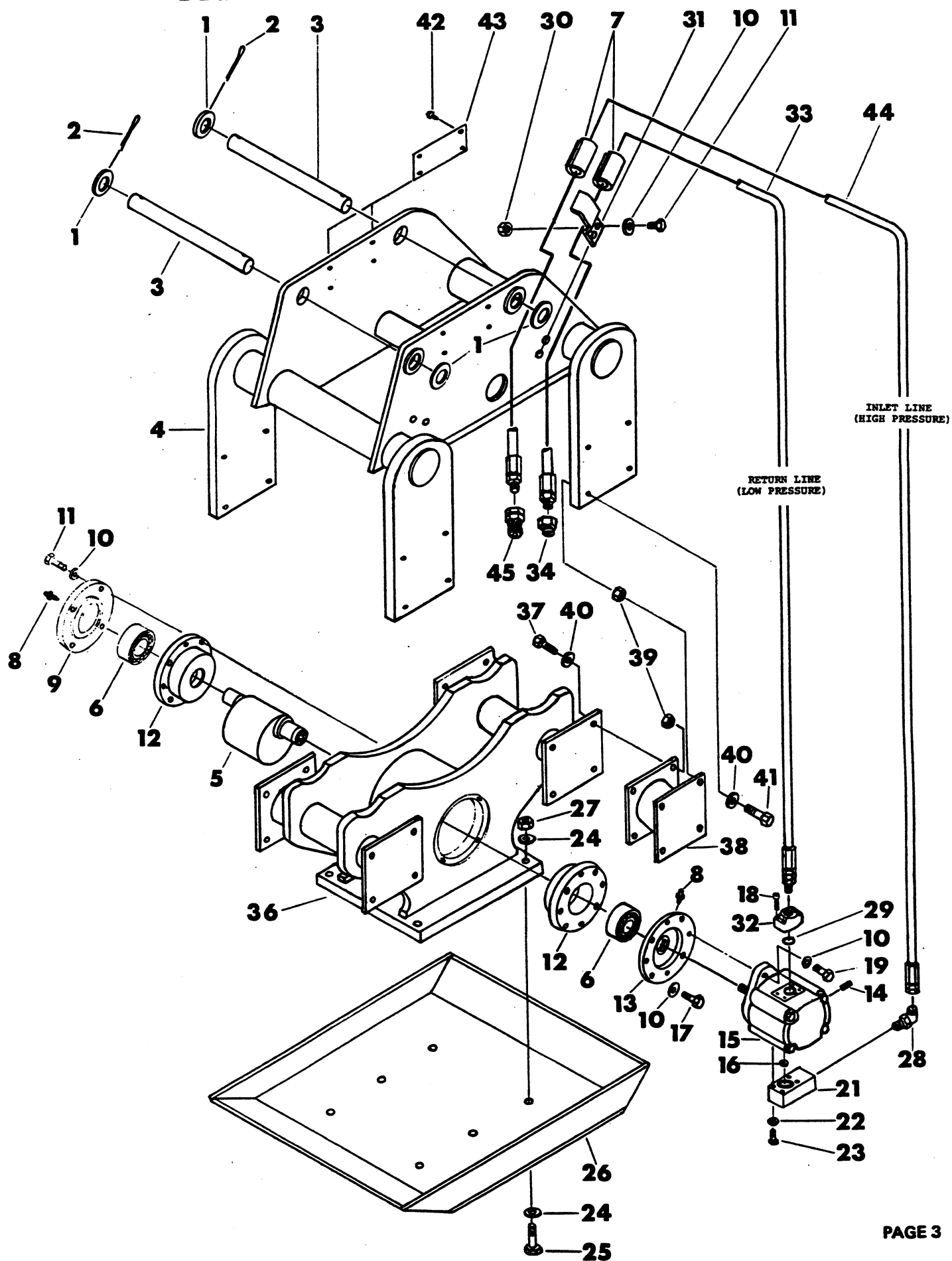
MODEL 9700 HO-PAC  
COMBINATION PILE & SHEETING DRIVER  
AND SOIL COMPACTOR

Effective: June 1, 1977

719700 MODEL 9700 HO-PAC PARTS LIST

ITEM	S/N 431 & Up	S/N 380 to 431	S/N Below 380	QTY.	DESCRIPTION
1	719043	719043	719043	4	Thrust Washer
2	563802	563802	563802	4	Cotter Pin
3	719025	719025	719025	2	Boom Pin
4	719724	719724	719724	1	Top Mounting Frame
5	719006	719006	719006	1	Eccentric
6	719007	719007	719007	2	Bearing
7	719712	708544	708544	2	Hose Protector
8	798197	798197	798197	2	Grease Fitting
9	719010	719010	719010	1	Cover Plate
10	719015	719015	719015	14	Flat Washer
11	719011	719011	719011	6	Hex Head Cap Screw
12	719008	719008	719008	2	Bearing Housing
13	719009	719009	719009	1	Adaptor Plate
15	719717	719017	719017	1	Hydraulic Motor
16	719027	719027	719027	1	O-Ring
17	719013	719013	719013	4	Hex Head Cap Screw
18	813254	—	—	4	Socket Head Cap Screw
19	719018	719018	719018	2	Hex Head Cap Screw
20	—	719039	719039	1	Male Connector
21	719012	719012	719012	1	Manifold
22	719026	719026	719026	4	Flat Washer
23	719014	719014	719014	4	Hex Head Cap Screw
24	719003	719003	719003	12	Flat Washer
25	719002	719002	719002	6	Hex Head Cap Screw
26	719001	719001	719001	1	Base Plate
27	719004	719004	719004	6	Heavy Hex Nut
28	719037	719037	719037	1	90° Adaptor Elbow
29	719338	—	—	1	O-Ring
30	719016	719016	719016	2	Heavy Hex Nut
31	719772	719728	719728	1	Hose Clamp
32	719337	—	—	1	Flange
33	719711	719731	719031	1	Hose Assembly
34	719029	719029	719029	2	Quick Disconnect Plug
36	719705	719705	719705	1	Housing
37	719730	719730	719730	16	Hex Head Cap Screw
38	719749	719749	719749	4	Rubber Mount
39	813289	813289	813289	32	Elastic Stop Nut
40	708512	708512	708512	32	Flat Washer
41	719720	719720	719720	16	Hex Head Cap Screw
42	617034	617034	617034	8	Drive Screw
43	719742	719742	719742	2	Name Plate
44	719732	719732	719031	1	Hose Assembly
45	719034	719034	719029	2	Quick Disconnect
			719194	2	Dust Cover

# MODEL 9700 HO-PAC



4. **INSTALLATION AND OPERATION:** Excavators with hydraulic capacities of 33 GPM (at rated pressure) are adequate for simultaneous Ho-Pac and backhoe operation.

Hydraulic pressure developed during Ho-Pac operation is simply that which is encountered by the working resistance. In other words when the running Ho-Pac is hanging in mid-air, the pressure will be around 500 PSI, and when compacting, the pressure will rise to some point between this value and relief setting. Pressure relief valves should be set no higher than 2500 PSI.

Full instructions are furnished with each kit and those specifics must be followed. In general, this is what must be done:

- A. Break the pressure line at a point just before the backhoe valve bank. At this point the flow divider valve is interposed, with the upstream line just broken connecting to the "P" (pressure) port of the flow divider valve and the downstream line (that going to backhoe valve bank) connecting to the "EF" (excess flow) port.
- B. A line then connects the "CF" (controlled flow) port of the flow divider valve and either of the main ports of the Ho-Pac motor (the motor is reversible and it does not matter which port is pressurized and which port is made return).
- C. The following then "go to tank" (connect to the low pressure side of the system): return line from Ho-Pac motor, line from relief valve (when supplied) of the flow divider (the "R" port), bleed line from flow divider (this port is unmarked but is that one which is drilled directly above and towards the rotary spool of the valve), and motor drain line (coming from side port of motor).

5. **ADDITIONAL OPERATING HINTS:**

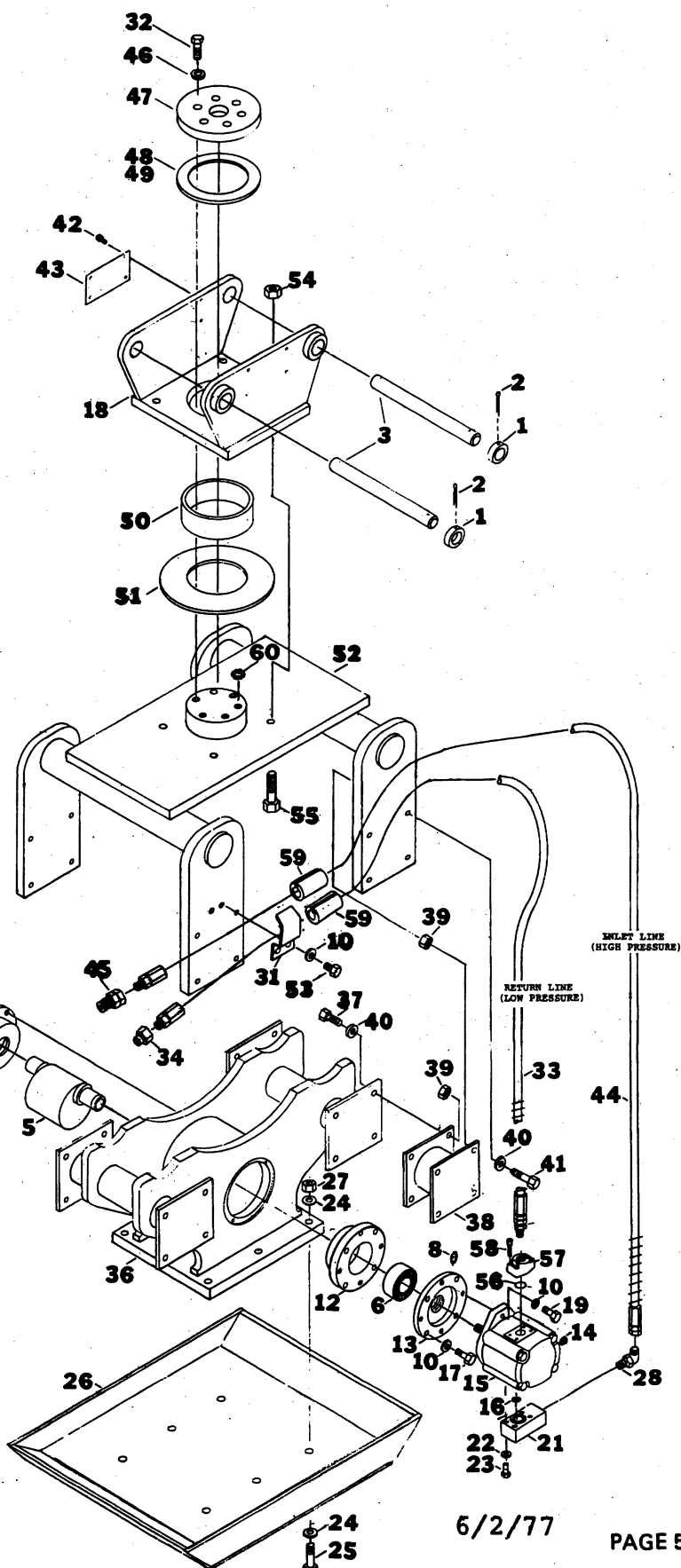
- A. Do not try to operate the Ho-Pac without the base plate (ITEM 26.)
- B. Do keep the hoses in a "loop" (between motor and top mounting bracket).
- C. Do use only genuine Allied parts as replacement items.
- D. Do make use of the nylon ties provided with the kit to effect a clean installation. Additional quantities can be purchased from your distributor.
- E. The hydraulic system will run cooler if you run the engine no faster than necessary for reasonable speed of backhoe operation (while Ho-Pac is running).
- F. The flow divider is a variable speed control device. With the handle full on, the Ho-Pac will run at the maximum rated speed, and this will be the best setting for some applications. Experience has shown that, on occasion, more production is achieved by operating at a speed less than maximum.
- G. Keep return line and motor drain line restrictions to a minimum and maintain a clean filter. Follow manufacturer's recommendation concerning hydraulic system maintenance.
- H. Down pressure is generally useful, as is vibration, in compaction or sheet driving.
- I. Best motor life is achieved by running it half the time clockwise and half the time counter-clockwise. Reversal is achieved by crossing main lines at the quick disconnects.

# 9700 HO-PAC

## W / SWIVEL TOP ASSEMBLY

### PART NO. 719750

ITEM	QTY	PART NO.	DESCRIPTION
1	4	719043	Thrust Washer
2	4	563802	Cotter Pin
3	2	719025	Boom Pin
5	1	719006	Eccentric
6	2	719007	Bearing
8	2	798197	Grease Fitting
9	1	719010	Cover Plate
10	12	719015	Flat Washer Hdn
11	4	719011	Hex Head Cap Screw
12	2	719008	Bearing Housing
13	1	719009	Adaptor Plate
14	1	563618	Pipe Plug
15	1	719717	Hydraulic Motor
16	1	719027	O-Ring
17	4	719013	Hex Head Cap Screw
18	1	719602	Swivel Weldment
19	2	719018	Hex Head Cap Screw
21	1	719012	Manifold
22	4	719026	Flat Washer
23	4	719014	Hex Head Cap Screw
24	12	719003	Flat Washer
25	6	719002	Hex Head Cap Screw
26	1	719001	Base Plate
27	6	719004	Heavy Hex Nut
28	1	719037	90° Adaptor Elbow
31	1	719772	Hose Clamp
32	6	719710	Hex Head Cap Screw
33	1	719711	Hose Assembly
34	1	719029	Q D Plug
36	1	719705	Housing
37	16	719730	Hex Head Cap Screw
38	4	719749	Rubber Mount
39	32	813289	Elastic Stop Nut
40	32	708512	Flat Washer
41	16	719720	Hex Head Cap Screw
42	8	617034	Drive Screw
43	2	719742	Name Plate
44	1	719732	Hose Assembly
45	1	719034	Q.D. Socket
46	6	719021	Flat Washer Hdn
47	1	617077	Thrust Plate
48	1	617079	Top Bearing Washer
49	2	617192	Shim - as required
50	1	708594	Thrust Bushing
51	1	617078	Bottom Bearing Washer
52	1	719753	Stationary Weldment
53	2	719708	Hex Head Cap Screw
54	1	620600	Elastic Stop Nut
55	1	719520	Hex Head Cap Screw
56	1	719338	O-Ring
57	1	719337	Flange
58	4	813254	Socket Head Cap Screw
59	2	719712	Hose Protector
60	6	563610	Serrated Lockwasher



6/2/77

# COMPACTING & DRIVING TECHNIQUES WITH THE ALLIED HO-PAC®

The Allied HO-PAC® is a high impulse tool, utilizing three basic forces: the HIGH IMPULSE FORCE on the eccentric turning at a high RPM not only produces impulse force, but also, when properly controlled, gives an impact force; secondly, the DOWN PRESSURE of the backhoe on which it is mounted or other carrier gives a high static or pressure which assists in the compaction. Thirdly, the HO-PAC® produces frequency or VIBRATION, since the tool has been set to vibrate at 2100 vibrations per minute for maximum effectiveness in the compaction of granular materials.

The HO-PAC® has been very effective in compacting clay materials in lifts of from 12" to 24" (depending upon the composition of the clay material) and in compacting granular materials in lifts from 2' to over 4' (depending upon the composition of the material). Its effectiveness in clay materials is due to the first two of the three forces that have been outlined.

In clay material, the high impulse force and down pressure combine to produce a compaction effort similar to an impact type without danger of damaging pipe. It is possible to reach densities in excess of 95% Modified Proctor quickly by holding the HO-PAC® position for not more than 15 seconds in each spot and going over the area only twice. Production achieved by the Allied HO-PAC® should be from 25 to 30 cubic yards per hour with the Model 8700, and from 50 to 60 cubic yards per hour with the Model 9700 in clay-type materials. Near optimum moisture is recommended. However, the HO-PAC® will compact dryer clays and bring moisture up from below, if any is available. An optional base plate is offered by Allied with a sheepfoot pattern which is also very useful in clay material and can increase the lift and thereby increase the production of the HO-PAC®.

The compaction of granular materials with the Allied HO-PAC® consists of the same type of technique. However, because of the vibration characteristics of the HO-PAC®, much greater productivity can be realized and densities exceeding 95% Modified Proctor can be obtained in lifts from two feet to over four feet, depending upon the composition of the material and the width of the excavation. The narrower the excavation, the greater the lift that can be achieved and yet still reach the required density. The operator technique is again like that used in the clay-type materials where the backhoe operator applies full backhoe down pressure again. Usually twice over the area is sufficient to accomplish compaction and then the hoe is moved to a new area.

It is very important that the HO-PAC® operator not start in the middle of an uncompacted area, but always starts near the edge or near the end against or near the previously compacted material, a solid wall or bank.

A common technique used in compacting pipe trenches is one that only the HO-PAC® will do efficiently, and that is the slope backfill technique. This slopes the backfilling from the pipe to the ground level so that the backfill falls to an approximate 45° slope. To start this technique it is necessary to compact into a corner or against a manhole, or against previously compacted material. Come up from the pipe to ground level with backfill material. The backhoe is placed on the already compacted material. The HO-PAC® is used starting at the lowest point near the pipe and worked up the slope and then the procedure is repeated. Down pressure is then applied for about 15 seconds in each position. This enables the crew to keep their job closed up tightly. Thus the backfill operation is very close to the pipe-laying crew. An operator, with a Model 9700 HO-PAC® mounted on a large rubber tired backhoe, alone can backfill and compact over 500 cubic yards a day with this type of operation.

Quite often the job specification, project engineer, or inspector is hesitant to allow contractors to use a lift of 18 inches to 4 feet as we have recommended. This has been overcome by many contractors throughout the country by establishing before hand what the HO-PAC® will do in the material on a particular job. A very common procedure is as follows:

A contractor will dig four trenches, each approximately 20' long; one of them 2' deep, one 3' deep, one 4' deep and one 5' deep. He will place in the trench some pipe of the type to be used on the job, backfill and compact with the HO-PAC®. In attendance at this trial should be the job inspector or project engineer and a soils laboratory representative or the state or county soils lab that is to be used on the job. Complete testing is then done of all four trenches. If it is determined that the trench with the 3' depth passes the required density at all levels, but the trench with the 4' depth does not, then a 3' lift should be agreed upon by all concerned. It is sometimes necessary to institute a change order to get the approval. For special demonstrations and procedures, call upon your Allied distributor and an Allied representative for help in these matters. Should you need help in obtaining these changes, please advise your Allied distributor so that he may contact an Allied representative who has a great deal of experience in this procedure.

It is very important that the contractor not attempt to use lifts in excess of what the HO-PAC® will compact; otherwise the density in the entire area will not rise above a certain amount, i.e., if the HO-PAC® will compact in 3' lifts and the contractor puts in 5', chances are he will only obtain an approximate 85% Modified Proctor Density throughout.

### DRIVING WITH AN ALLIED HO-PAC®

Driving with the HO-PAC® uses the three HO-PAC® forces of impulse force, down pressure and vibration. Timber sheeting, steel sheet piles, "H" or "I" beams can be driven in lengths up to 40' by the HO-PAC®. They can be driven into most soils, including fine sand and rocky soils. Steel sheet pile, "H" or "I" beams will split and drive through many types of rocks up to fourteen inches in diameter. In driving through rocky ground, the HO-PAC® will push rock out of the way or split them. Test excavating has shown no deflection of the sheeting when the HO-PAC® is used in rocky ground.

In driving into soil such as clay (with moisture), sandy clay, sandy loam, black loam, etc., the HO-PAC® is placed on the pile and down pressure applied. Best results are obtained if the HO-PAC® is placed perpendicular to steel or timber sheet pile. Down pressure should not be so great as to collapse or bottom out the springs.

Driving into sand, splitting rocks, or driving into very hard clay requires a special technique. In driving sheet pile, the front portion of the baseplate of the HO-PAC® must be placed from 1/4 to 1/3 from the front edge of the sheeting. (In other words, don't place the center of the baseplate on the sheet pile.) Down pressure is applied until a deep rumble is heard. This condition means that the HO-PAC® is impacting the pile over 2,000 times per minute, but only a 1/4" space is allowed on the upstroke. If a rock or very hard material is encountered move the HO-PAC® so that only a corner of the HO-PAC® base plate is striking the pile and the impact distance is over 1". A pressure gauge in the HO-PAC® pressure line is very useful to determine the best working position for the HO-PAC®. When the HO-PAC® is doing maximum work, the pressure in this line will be over 2,000 psi. On the 9500 and 9700 HO-PAC® the hose from the top fitting on the hydraulic motor should be the return line. This will give the best rotation of the eccentric for driving with this technique.

Brackets or guides may be welded on the bottom of the HO-PAC® base plate to assist the operator. The impacting of the HO-PAC® on the pile will stress relieve the welds and weld failures are very rare.

## HO-PAC WARRANTY

ALLIED warrants its products to be well-made, durable and of good material and if within 90 days from the date of delivery of such new product to the actual and original purchaser or renter, but no more than 12 months from the date of shipment from Allied's factory, any part shall fail by reason of defective material or poor workmanship, ALLIED will, at its option, repair or furnish such part free of charge, F.O.B. factory where manufactured (or other place designated by ALLIED); provided, however, that the defective part or sufficient evidence of such defect in the part be delivered to its factory in the United States where manufactured (or other place designated by ALLIED), transportation prepaid. Such parts or such evidence must clearly show that the failure was due to poor workmanship or defective material and not due to the negligence or improper use by such purchaser, renter or operator.

Breakage or damage resulting from installation or operation or use not in accordance with ALLIED'S published installation and operating instructions are not covered by any warranty.

Operation or use beyond published capacities, substitution or interchanging of parts or any alterations not approved by ALLIED shall void this warranty.

ALLIED'S responsibility and warranty applies only when this equipment is operated and used in accordance with (1) its published instructions and (2) pursuant to the terms, conditions and restrictions of any local, state, dominion or federal laws, ordinances and regulations. The purchaser, user or renter assumes the responsibility to familiarize himself with such published capacities, instructions, terms, conditions and instructions as set forth above. ALLIED'S warranty is voided if the serial number is removed or altered in any way.

This is ALLIED'S sole warranty. ALLIED makes no other warranty of any kind whatsoever, express or implied; and all implied warranties of merchantability and fitness for any particular purpose which exceed the aforesaid stated obligation are hereby disclaimed by ALLIED and excluded from this agreement.

ALLIED specifically disclaims any responsibility for any damages of any kind or description, whether to property or person, in any way connected with or arising out of the use of its products.



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