

DEMING VERTICAL TURBINE PUMPS

INSTALLATION INSTRUCTIONS

FOR FIG. 4750 OIL LUBRICATED PUMPS

Well

Measure the well to make sure it is of ample size and depth to receive the pump. The well must be sufficiently straight to allow the pump to hang freely with no misalignment.

Foundation

A concrete foundation should be constructed before the pump is installed to permit aligning the pump head with the well while lifting equipment is available. Provide an opening in the foundation large enough for the top column flange with ample clearance. If the well is out of plumb, the pump head must be placed so that the drive shaft will be on the same inclination as the well casing. This is important. The foundation should be large enough to carry the weight of the pump without settling.

Tools

The following tools and equipment are required for satisfactory installation:

Derrick, gin pole with chain hoist, winch truck, well rig or similar equipment with at least 14 foot clearance (more for long bowl assemblies) and sufficient capacity to safely handle the weight of the complete unit.

Two pipe clamps or pipe elevators of proper size for pump column.

Two chain pipe tongs (If column has screwed couplings).

Two small pipe wrenches for screwing shaft together.

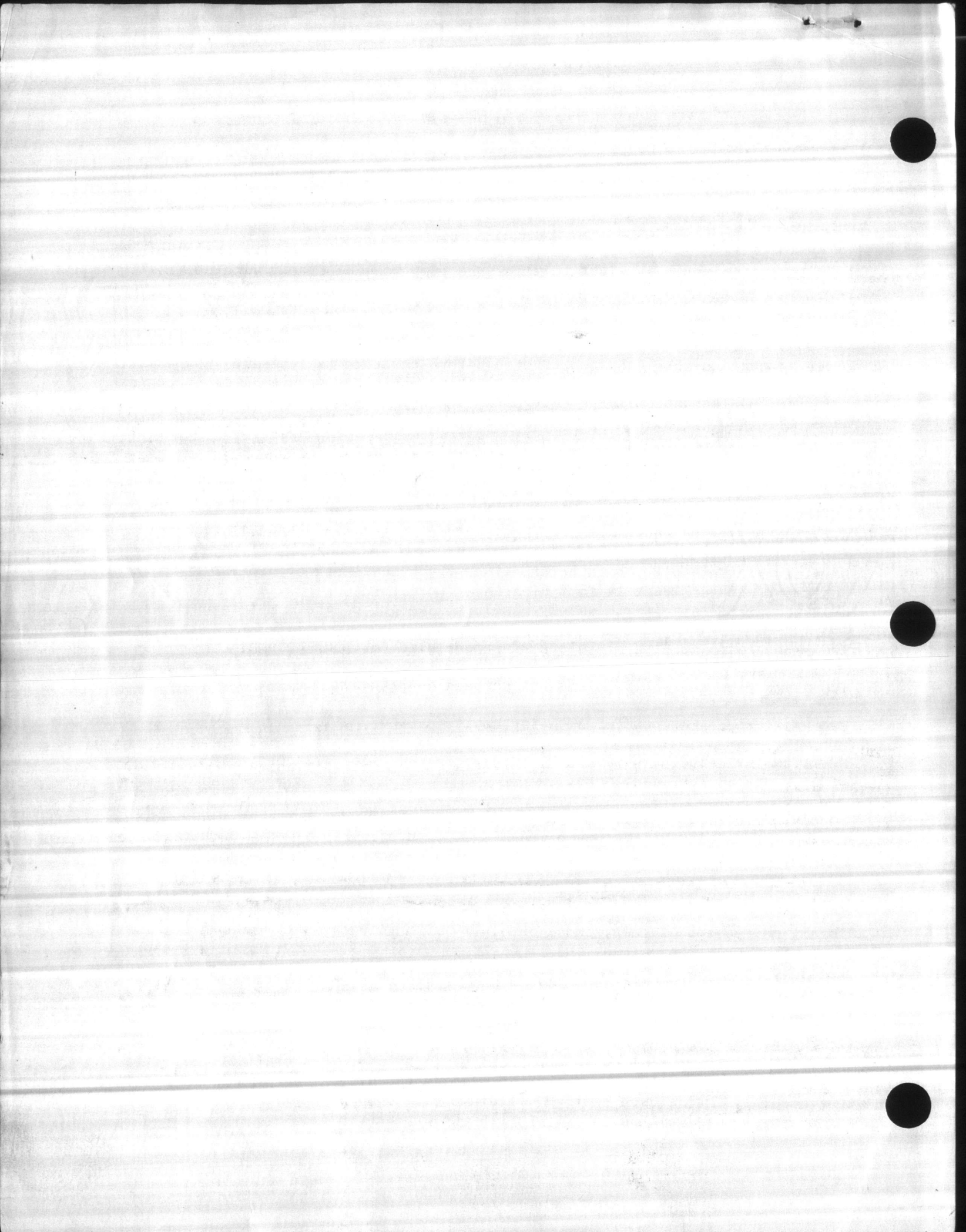
Small tools including wire brush, three-cornered file, wrenches, can of pipe thread lubricant, etc.

Supply of lubricating oil for pump and motor. (SAE10 or preferably a Medium Ice Machine Oil for pump and SAE 20 or preferably a Heavy Turbine Oil for motor. See list of recommended oils on Pages 5 and 6.)

Preparation

Immediately on receipt of pump, check carefully with packing list. Report any loss or damage to transportation company and to factory. Keep all parts in good dry storage. When ready to install, unpack material and lay out on skids or boxes near well. Check shafts for straightness. Roll on ways if any question as shafts must be almost perfectly straight.

Assemble column sections by screwing two pieces of intermediate enclosing tube together with lineshaft bearing in upper end of each tube. Run shaft through tube taking particular care not to bend shaft or damage threads or bearings. Place a shaft and tube assembly inside each section of column with column coupling and lineshaft bearing on end toward well and shaft coupling on opposite end.



Special Precautions

1. Column pipe threads are right hand; shaft and tube threads are left hand.
2. Protect all parts from dirt, especially the shaft, shaft enclosing tube and machined surfaces. Keep threads perfectly clean. Any dirt or foreign material between ends of shafts or other parts may cause misalignment and unsatisfactory operation.
3. Handle shaft with extreme care to avoid bending.
4. All shaft and shaft enclosing tubes must butt solidly. Column must butt against the spacer or centering spider; otherwise differences in length may develop during installation.

Installing Bowl Assembly

If headroom permits, screw strainer on suction pipe and suction pipe into bowl assembly before raising bowl assembly from ground. Where headroom is limited or assembly is long, lower suction pipe into well with strainer attached and hold with clamp. Raise the bowl assembly, taking particular care not to place too much strain on the bowls, and screw the bowl assembly on the suction pipe. If necessary to place clamp on bowl assembly, make sure this is located over a joint and not on the shell of a bowl.

Loosen clamp on suction pipe and lower assembly into the well until the upper clamp or elevator rests on top of casing or foundation.

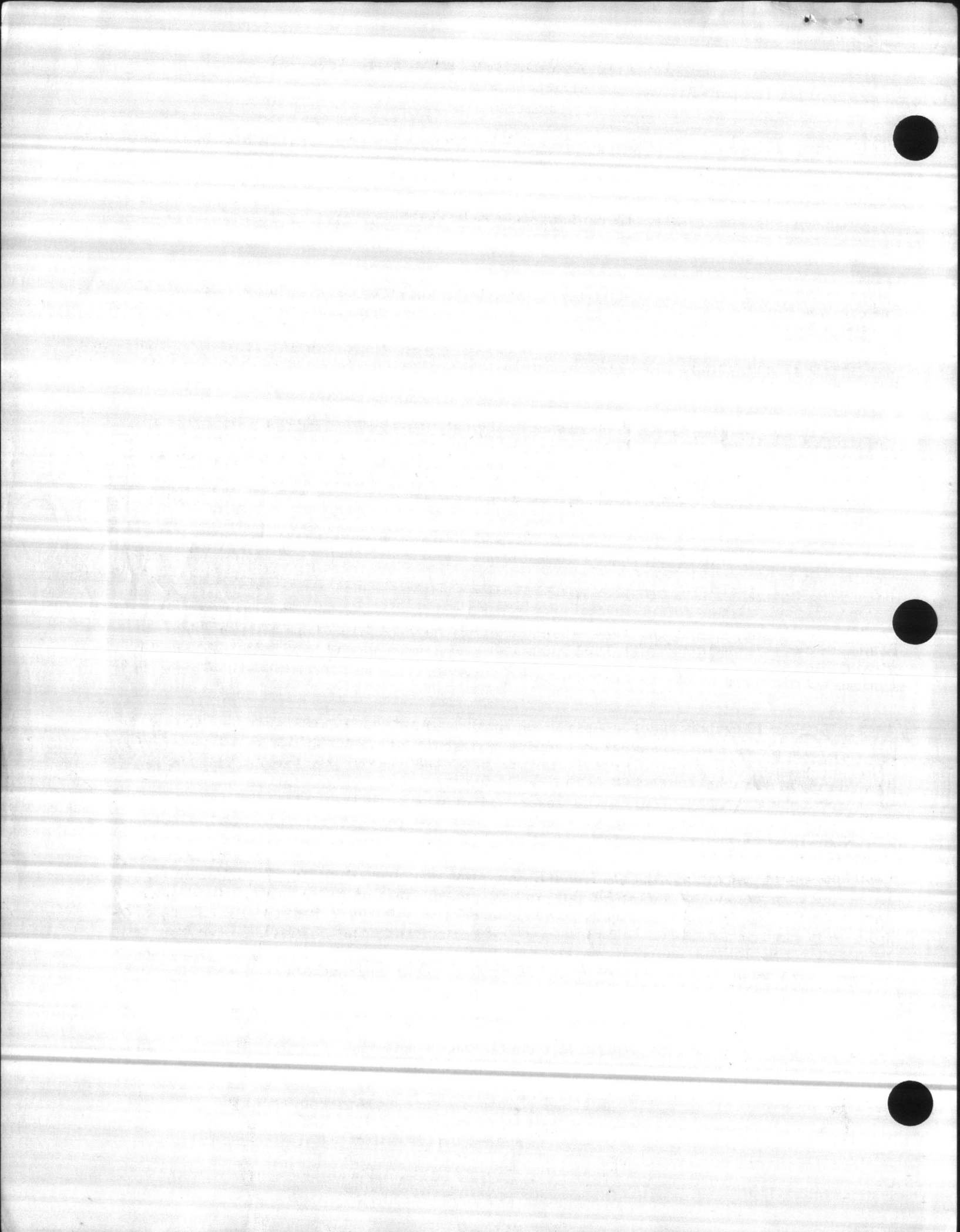
Installing Column

Locate the column, shaft and tube assembly with the enclosing tube marked "Bottom Section". This should be installed just above the bowl assembly. Adapter bearings are furnished for the bottom section when necessary to adapt from one tube size to another.

Place clamp or elevator under coupling on upper end of the bottom section column assembly and raise over the well. Support the shaft and tube assembly by hand or with a rope sling, taking particular care not to bend the shaft. On larger pumps a small pipe clamp to fit the shaft and a length of manila rope will assist in supporting the shaft and tube assembly. Carry the lower end of the column or slide it on a plank so as not to damage threads. Make sure all threads are perfectly clean. Paint outside pipe threads with a good thread lubricant. Oil shaft threads and wipe off excess oil.

Screw the shaft into the impeller shaft coupling and tighten. It is important that shafts butt in center of coupling but do not use excessive force which might cause misalignment. Then screw the enclosing tube on the lineshaft bearing extending out of the top bowl and tighten. Then screw the column into the column adapter, or if the adapter is flanged, bolt it to the top bowl. Lower complete assembly into the well and hold with clamp. Remove the bearing and pour approximately one-half cup full of SAE10 oil into the inner column. Replace the bearing. Place a centering spider in the column coupling.

Assemble another section of column and shaft and repeat the above procedure. A centering spider should be placed in the column coupling about 10 feet above the bowl assembly and at approximately 50 foot intervals throughout the column assembly. Either spacer or a centering spider must be placed in each column coupling.



Repeat this procedure until all of the column except the top section has been installed.

Assemble the top section of column and shaft which includes column with top flange and enclosing tube marked "Top Section". This length of tube has special threads and is finished on the outside at the upper end. Lower into well and hold with clamp.

Installing Head Assembly

Place a double chain sling through the head and raise it over the pump. Remove the tubing head adapter from the head. It may be necessary to bump it lightly with a wooden block. Make sure flange on lower side of head is clean and that studs are not damaged. Clean the top column flange and place paper gasket on it. Line up studs and the opening through the head with holes in top flange and lower the head carefully onto the top flange. Make sure the register fits and tighten stud nuts securely.

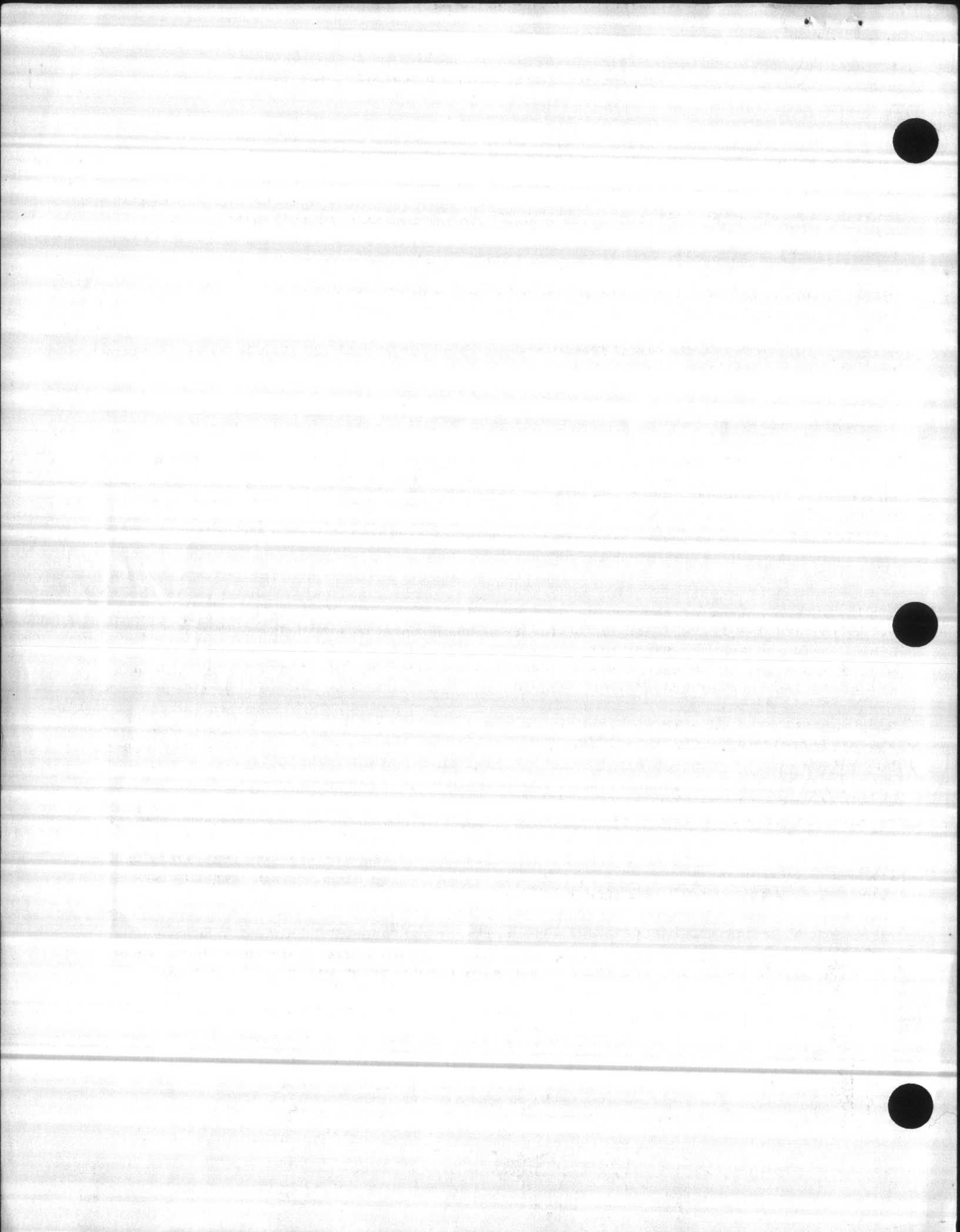
Then raise the complete pump assembly and remove the clamps. Rotate the unit until the discharge flange is in the desired direction and lower onto foundation. If the head does not rest evenly on the foundation, lift the unit and place metal shims or washers under each corner. The head must be supported on the foundation so that it is in line with the column and shaft. Never level a pump head on foundation with a spirit level.

Pour one-half cup of oil into the open end of the shaft enclosing tube. Grease the flange and place gasket for the tubing head adapter. Grease the finished surface on the upper end of the top section enclosing tube. Make sure the "O" Ring is in the groove at the bottom of the tubing head adapter. Place the adapter over the top shaft extension and the top section enclosing tube using care to avoid damaging "O" Ring. Draw the adapter tight with stud nuts. If follower is furnished it should be placed above the "O" Ring. Place the tension nut over the shaft and tighten it until the enclosing tube is under proper tension.

Bolt the oil reservoir to the bracket on the discharge head. Connect the tubing from the oil reservoir to the tubing tension nut. Screw the headshaft coupling on the top column shaft. Place a cloth over coupling to avoid any possibility of foreign material dropping into it while motor is being mounted.

Installing Motor or Drive

Check motor nameplate to make sure it is suitable for the electric current available and the proper speed for the pump. Use eye bolts in top of motor for lifting motor only. Do not use these eye bolts for lifting motor and pump together. Set motor on pump head making sure that base of motor and top of head are clean and that register fits properly. Bolt motor in place with bolts or cap screws furnished. Remove motor canopy and top drive coupling. Lower headshaft through hollowshaft of motor with end of shaft having keyway at the top. Tighten in headshaft coupling.



Aligning Pump

Check alignment of pump head on foundation by noting the clearance around the headshaft at top of motor. If the headshaft stands to one side in hollowshaft, place metal shims or washers between the head and foundation on the opposite side so that the headshaft will stand exactly in the center. The straightness of the headshaft, top column shaft, and coupling may be checked by installing the top drive coupling, raising the impellers, and turning the rotating assembly 180° . Then remove the top drive coupling and the shaft should remain in the center of the hollowshaft. Raise the complete pump assembly and without moving the shims, spread a layer of cement on the foundation. Then let the pump down until it rests in exactly the same position as before. Recheck position of top shaft. After cement sets, tighten foundation bolts.

Checking Rotation

Have the motor wired and check rotation before installing the top drive coupling. Rotation must be counter-clockwise when looking at top of motor. (See arrow on pump head.) Motors with built in non-reverse ratchet may be energized momentarily without injury to the ratchet assembly. If rotation is incorrect, reverse two leads on three phase motor. Refer to diagram on single phase motor.

Adjusting Impellers

Place top drive coupling over shaft and insert gib key. Tighten adjusting nut until impellers are raised off bowl seats and shaft just turns freely by hand. Then raise approximately one-half turn for each 100 feet of setting. It is better to raise more than necessary for starting and then make closer adjustment gradually. Install lock screw and tighten before starting pump. For maximum performance, impellers should be adjusted so that they run as close as possible and yet do not rub at maximum pressure. If there is any unusual noise or vibration, stop the pump and recheck impeller adjustment. A wattmeter or ammeter may be used to obtain very close adjustment.

If the well may contain sand, raise impellers about twice the normal amount when first starting the pump and then readjust the impellers after the well has cleared. If the well does not produce sufficient water to supply the pump, the capacity of the pump should be reduced by raising the impellers. Once correct adjustment has been made it should not be necessary under normal conditions to change this unless there is a change in pumping or well conditions.

A gate valve should be placed in the discharge line. Leave this valve about three-quarters closed when the pump is started. After the water reaches the surface, open the valve slowly to avoid over pumping the well and to maintain normal discharge pressure on the pump. If the pump is connected to a rigid discharge line a Dresser type flexible coupling should be used to prevent any settling or misalignment from placing a strain on the pump head.

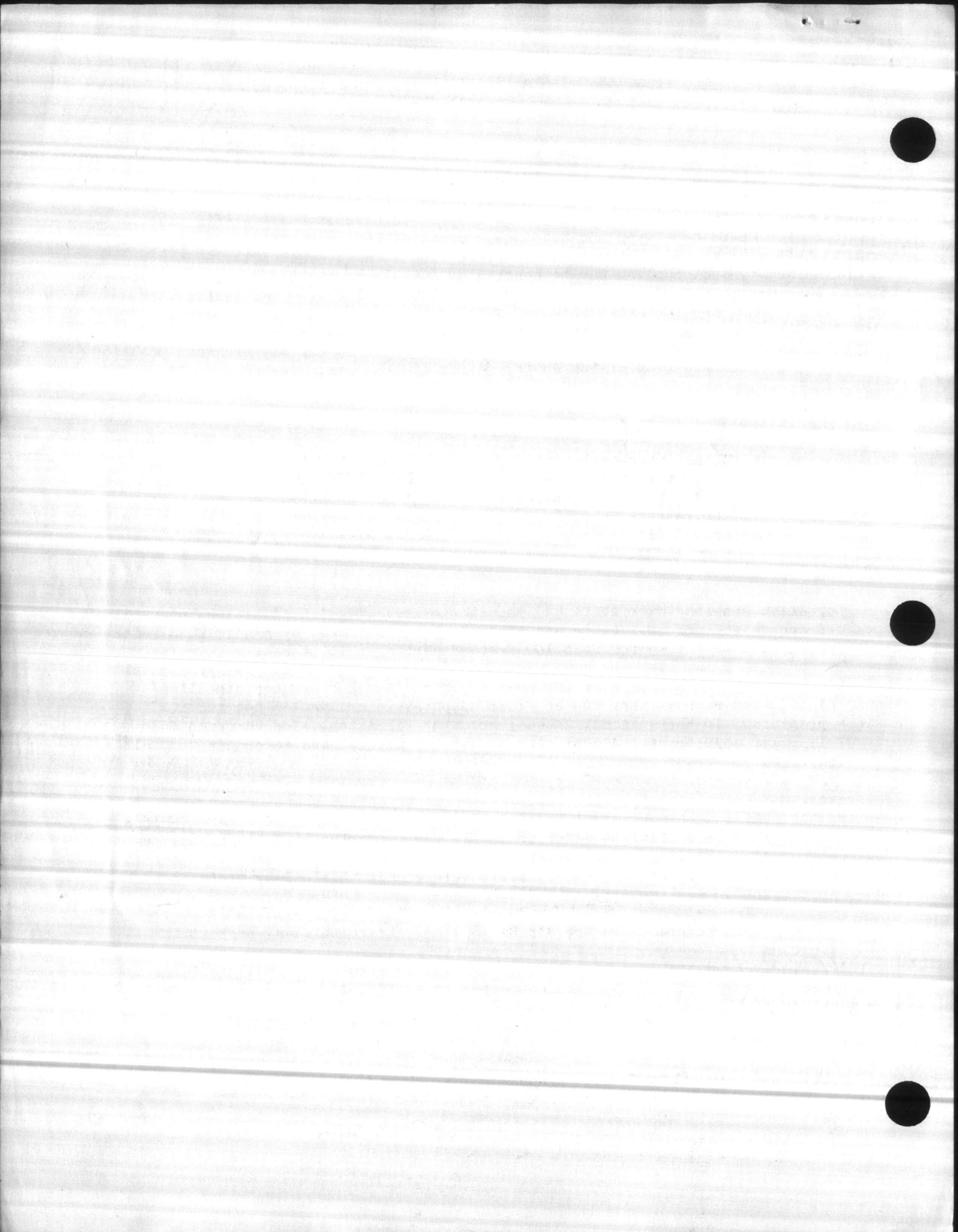


FIG. 4750 INSTRUCTIONS (Cont'd)

5.

Lubrication

Pump Line Shaft Bearings

On Fig. 4750 Oil Lubricated Pumps the lineshaft bearings are lubricated with oil from a reservoir located on the pump head. Fill the oil reservoir with one of the following oils or their equivalent. If necessary, an SAE10 motor oil may be used temporarily.

Recommended Oils for Pumps

<u>Manufacturer</u>	<u>Oil</u>
Cities Service Oil Co.	Globe Oil #5
Gulf Refining Co.	Eskimo Oil "B"
Pure Oil Co.	Klondyke Oil
Sinclair Refining Co.	Medium Ice Machine Oil
Socony-Vacuum Co.	Gargoyle Artic Oil "C" Heavy
Standard Oil Co.	Medium Ice Machine Oil
Sun Oil Co.	Sunvis 921

Solenoid line shaft oilers should be wired in accordance with instructions furnished with each oiler. Note that the voltage rating of the solenoid must be the same as the voltage supplied to the motor.

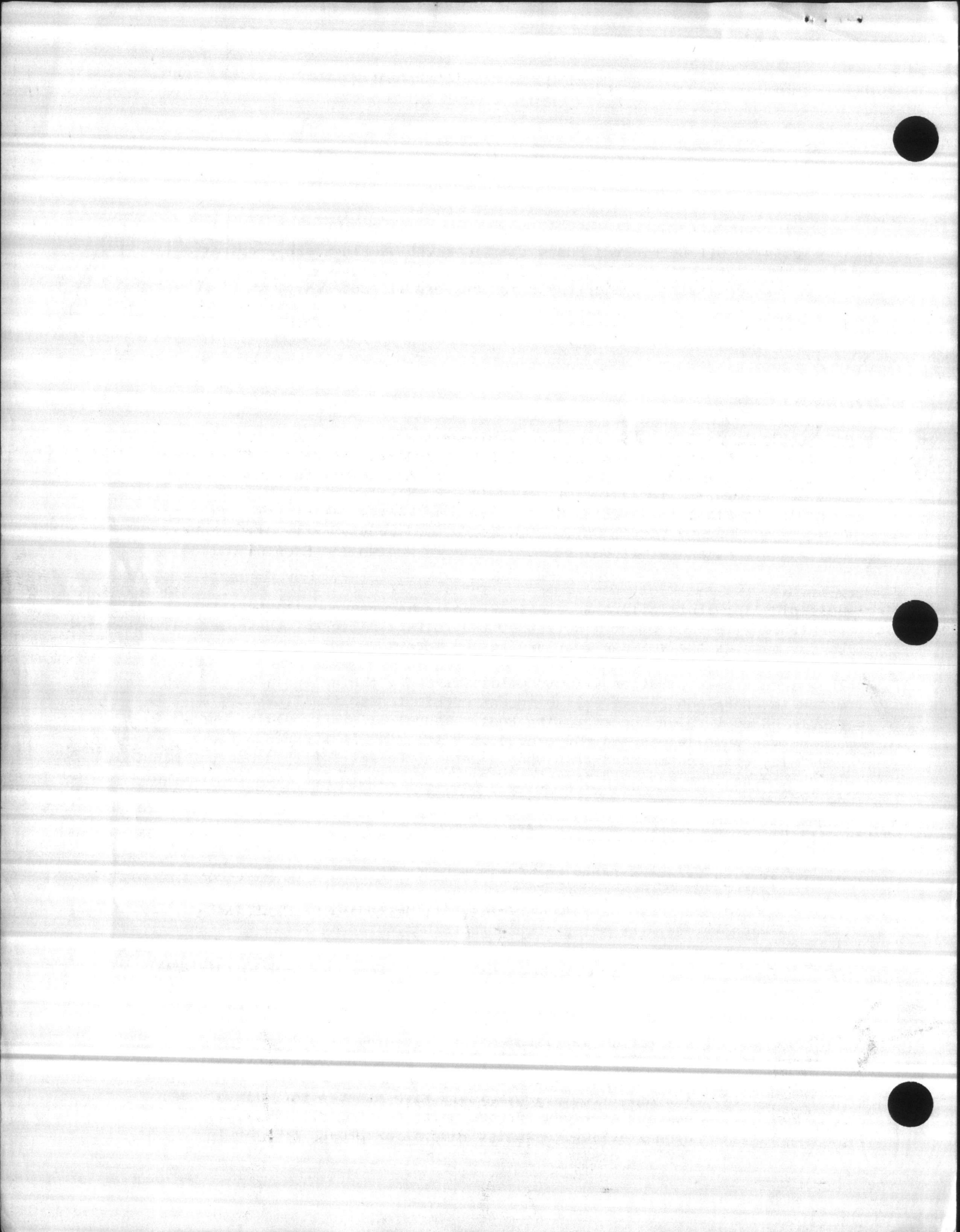
The lineshaft lubrication is automatic. That is, the solenoid opens when the motor is energized. However, the amount of oil fed to the lineshaft must be regulated by turning the adjusting knob. Manual oilers should be opened before the pump is started and closed when the pump is stopped. For the first few days, it is recommended that the adjustment be set for 15 drops per minute. It should be then adjusted to about 4 drops per minute for each 100 feet of column.

Motor with Grease Lubricated Bearings (Lubricated at factory before shipment).

A. Motor with grease fitting and drain plug in each bearing housing.

Once each six months or once a year, depending on operating conditions, the motor should be relubricated as follows:

1. Remove drain plug or grease ejector.
2. Apply pressure gun to grease fitting and inject new grease until all old grease has been forced out of the bearing through the grease drain. If a grease ejector is supplied, assist flushing of old grease by slowly working the plunger back and forth several times to remove grease from the drain.
3. Run motor for approximately five minutes to relieve bearing of excess grease using ejector immediately upon starting to assist removal of grease from drain.
4. Replace drain plug or ejector.



Lubrication

B. Motor with grease fitting only in each bearing housing.

Once each six months or once a year, depending upon operating conditions, add a small amount of grease. Then remove grease fitting and operate the motor about one-half hour before replacing the fitting to allow any excess grease to be expelled. The bearing may run warm (without injury) until the excess grease has been expelled. An approved motor bearing grease may be obtained from The Deming Co. in 1 lb. cans.

Motor with Oil Lubricated Bearing; Belt Drive, or Flexible Coupling Drive (Fill with Oil before starting).

Oil Lubricated motors and drives are shipped without oil and should be filled with the proper grade of oil before starting. Check oil level once a week with pump idle. Change oil once a year or every 2000 hours operation, whichever occurs first. Change oil more frequently for continuous operation or under dusty conditions. For proper turbine oils refer to table. While special turbine motor oil is preferred, if necessary a SAE10 or SAE20 non-detergent pure paraffin base motor oil may be used temporarily.

Motor with Oil Lubricated Top Bearing and Grease Lubricated Lower Bearing. (Fill top oil reservoir before starting. Lower bearing greased at factory).

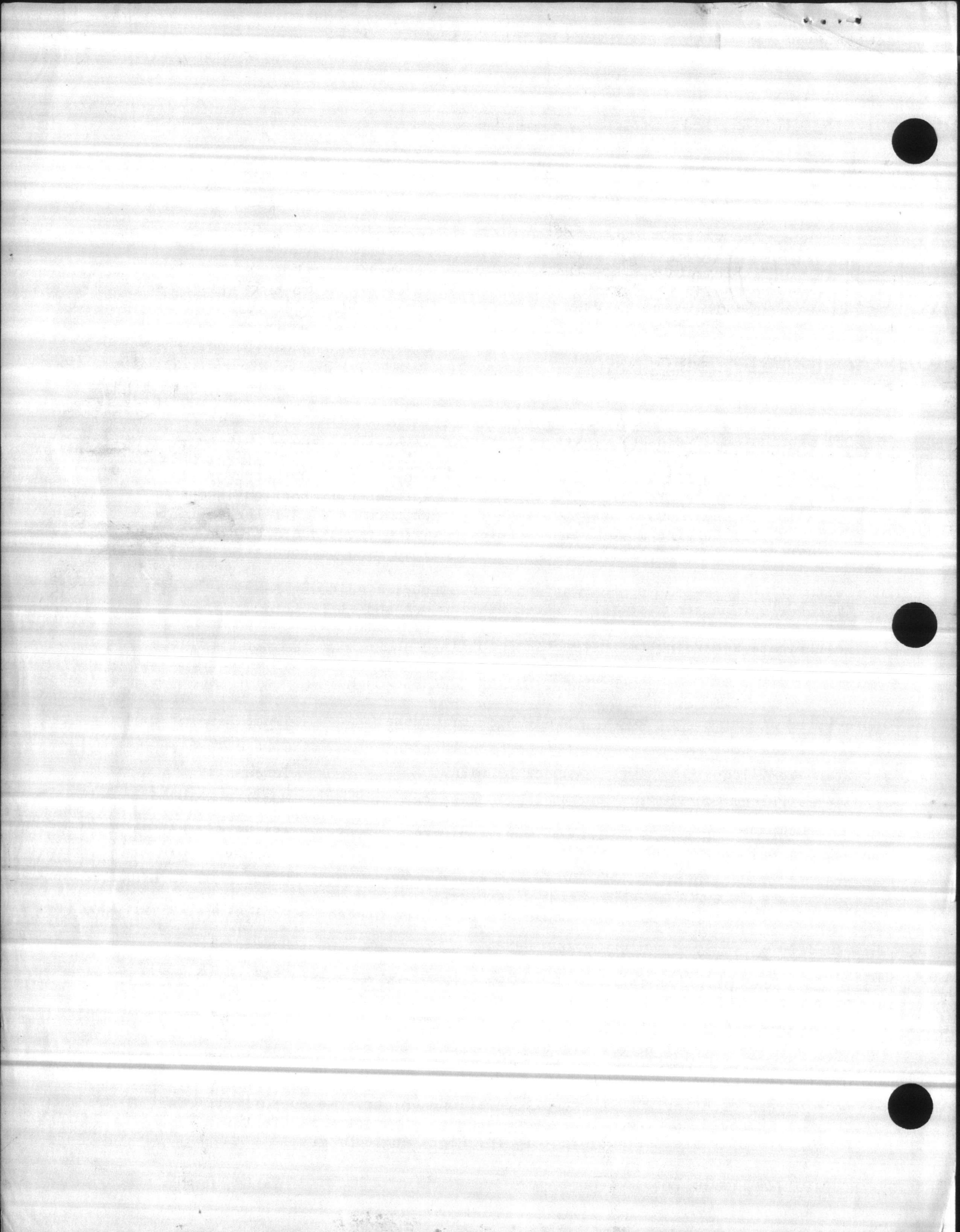
Relubricate according to instructions outlined above.

RECOMMENDED OILS AND GREASES FOR MOTORS

<u>Manufacturer</u>	<u>Trade Name of Grease</u>	<u>Trade Name of Oil</u>
Continental Oil Co.	Conoco Race Lube	Conoco Turbine Oil Light
Esso Standard Oil Co.	Andok Lubricant B	Teresso 43
Magnolia Petroleum Co.	Mobilux Grease #2	Mobil DTE 797
Shell Oil Company	Alvania Grease #2	Tellus 27
Socony-Mobil Oil Co.	Mobilux Grease #2	Mobil DTE 797
Standard Oil of California	Chevron Industrial Grease Medium	Chevron OC Turbine 9
Standard Oil of Ohio	Sohio #78 or Lubtec Grease	Sohivis 43
Sun Oil Company	Sun N-52X	Sunvis 916
The Texas Company	Regal Starfak #2	Regal A (R & O)
Tidewater Oil Co.	Veedol All-Purpose	Tycol Aturbrio 50

Right Angle Drive. (Fill before starting).

Refer to manufacturer's instructions which usually recommend changing oil once a year or after 2000 hours of operation, whichever occurs first. Use only an approved turbine oil as recommended by the drive manufacturer; Automotive oils are Not satisfactory for Right Angle Drives.

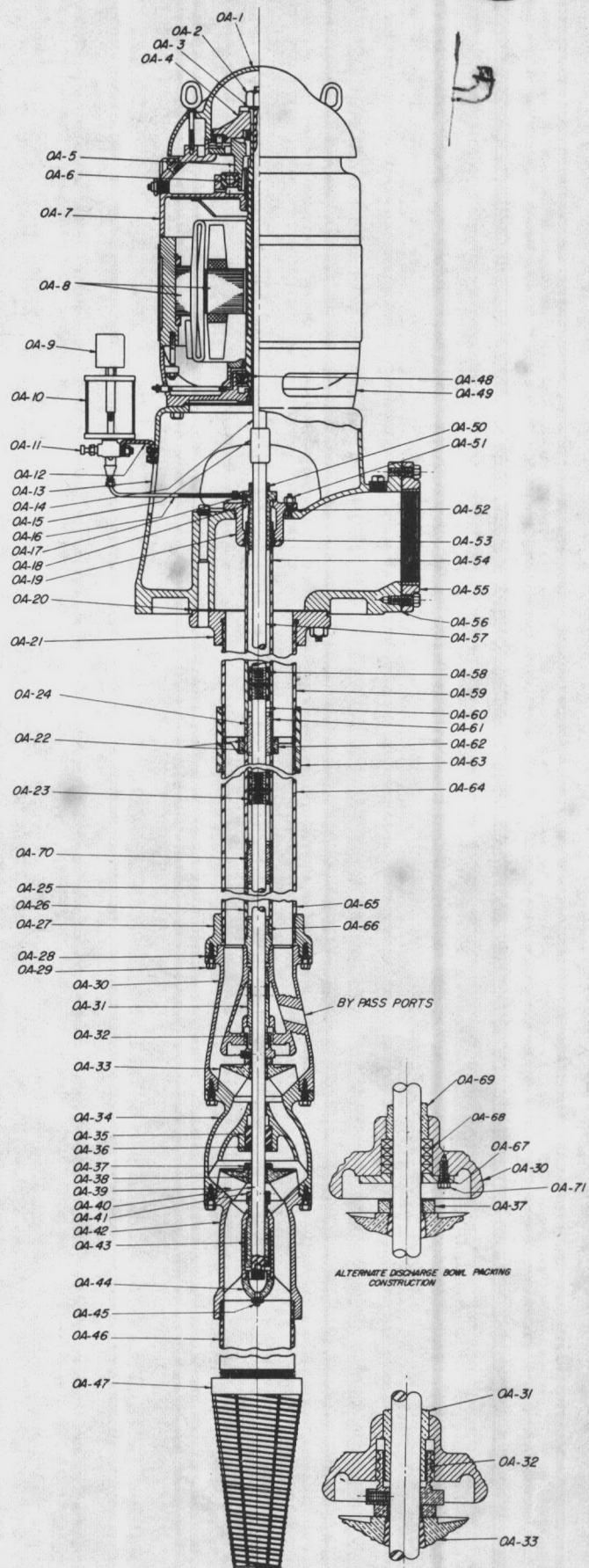


Deming Vertical Turbine Pumps

Parts List No. 55 - Fig. 4750 Oil Lubricated Pump

Bldg. 3506
MPC's-5
(P) Deming Pump
U.S. Elect. motor

- OA- 1 Canopy
- OA- 2 Adjusting Nut & Lock Screw
- OA- 3 Gib Key
- OA- 4 Pawl Disc Assembly
- OA- 5 Upper Bearing Mounting
- OA- 6 Upper Motor Bearing
- OA- 7 Upper Motor Bracket
- OA- 8 Motor Rotor & Stator
- OA- 9 Lubricator Solenoid
- OA-10 Lubricator Reservoir
- OA-11 Lubricator Adjustment Knob
- OA-12 Lubricator Bracket
- OA-13 Discharge Head
- OA-14 Head Shaft
- OA-15 Head Shaft Coupling
- OA-16 Lubricator Tubing
- OA-17 Tubing Connector
- OA-18 Tubing Tension Nut
- OA-19 Tubing Head Adapter
- OA-20 Top Flange Gasket
- OA-21 Top Column Flange
- OA-22 Centering Spider "O" Rings
- OA-23 Impeller Shaft Coupling
- OA-24 Line Shaft Bearing
- OA-25 Bottom Shaft
- OA-26 Bottom Enclosing Tube
- OA-27 Column Adapter
- OA-28 Bowl Gasket
- OA-29 Cap Screws
- OA-30 Discharge Bowl
- OA-31 Discharge Bowl Bearing
- OA-32 Sand Slinger
- OA-33 Impeller
- OA-34 Intermediate Bowl
- OA-35 Intermediate Bowl Bearing
- OA-36 Snap Ring & Cover Plate
- OA-37 Impeller Nut
- OA-38 Impeller Sleeve
- OA-39 Impeller
- OA-40 Impeller Shaft
- OA-41 Sand Cap With Set Screw
- OA-42 Suction Bowl
- OA-43 Suction Bowl Bearing
- OA-44 Suction Bowl Bearing Cap
- OA-45 Pipe Plug
- OA-46 Suction Pipe
- OA-47 Strainer
- OA-48 Lower Motor Bearing
- OA-49 Lower Motor Bracket
- OA-50 Felt Ring Dust Seal
- OA-51 Tubing Adapter Stud & Nut
- OA-52 Tubing Head Adapter Gasket
- OA-53 "O" Ring Tubing Seal
- OA-54 Top Enclosing Tube
- OA-55 Discharge Flange & Cap Screws
- OA-56 Discharge Flange Gasket
- OA-57 Top Column Shaft
- OA-58 Line Shaft Coupling
- OA-59 Top Column Pipe
- OA-60 Intermediate Shaft
- OA-61 Intermediate Enclosing Tube
- OA-62 Centering Spider (or Column Spacer)
- OA-63 Column Coupling
- OA-64 Intermediate Column
- OA-65 Bottom Column
- OA-66 Tube Adapter Bearing
- OA-67 Discharge Bowl Packing Gland
- OA-68 Discharge Bowl Packing
- OA-69 Discharge Bowl Brg. (Packing Type)
- OA-70 Lower Line Shaft Bearing
- OA-71 Gland Cap Screws



DEMING DIVISION, CRANE CO. SALEM, OHIO, U.S.A.

WELLS
#1 - Layne pump - 5 H.P. - U.S. Elect. motor, 1800 R.P.M.

3 - Layne pump - 15 H.P. - U.S. Elect. motor - 1800 R.P.M.

4 - Layne pump - 15 H.P. - U.S. Elect. motor - 1800 R.P.M.

5 } - Johnston Turbine pump - 7.5 H.P.
6 } U.S. Elect. motor.

7 - Layne pump - 5 H.P. - U.S. Elect. motor - 1750 R.P.M.

8 - " " " " " "

M-5(9) - Derring Pump - 5 H.P. - U.S. Elect. motor,

10 } - Johnston pump -
11 }