



# INSTRUCTIONS

BULLETIN 947066

## OILGEAR TYPE "PVAKMZ-054-TMZ" VARIABLE DELIVERY PUMPS

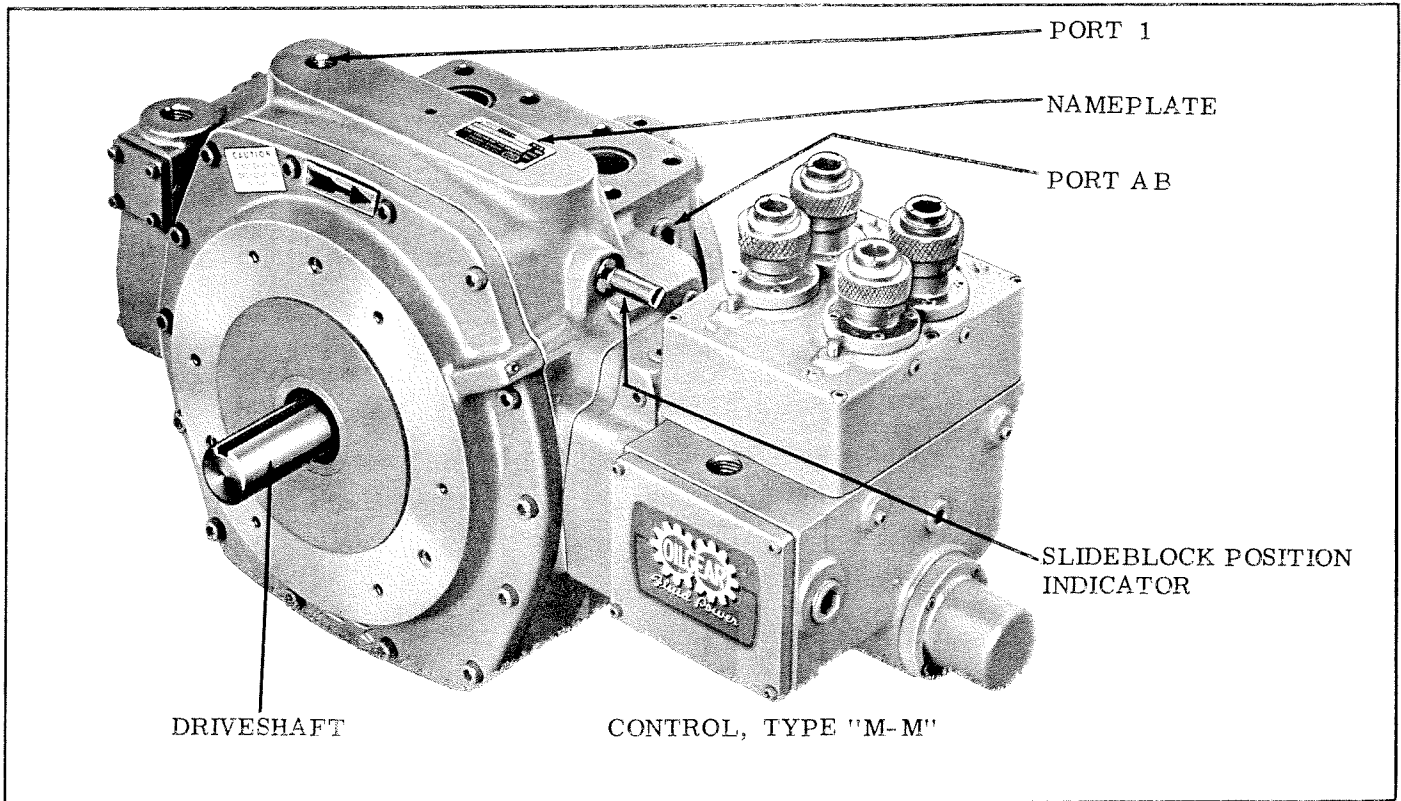


Figure 1. Oilgear Type "PVAKMZ-054-TMZ" Pump with Electric Multi-Position Control (54558).

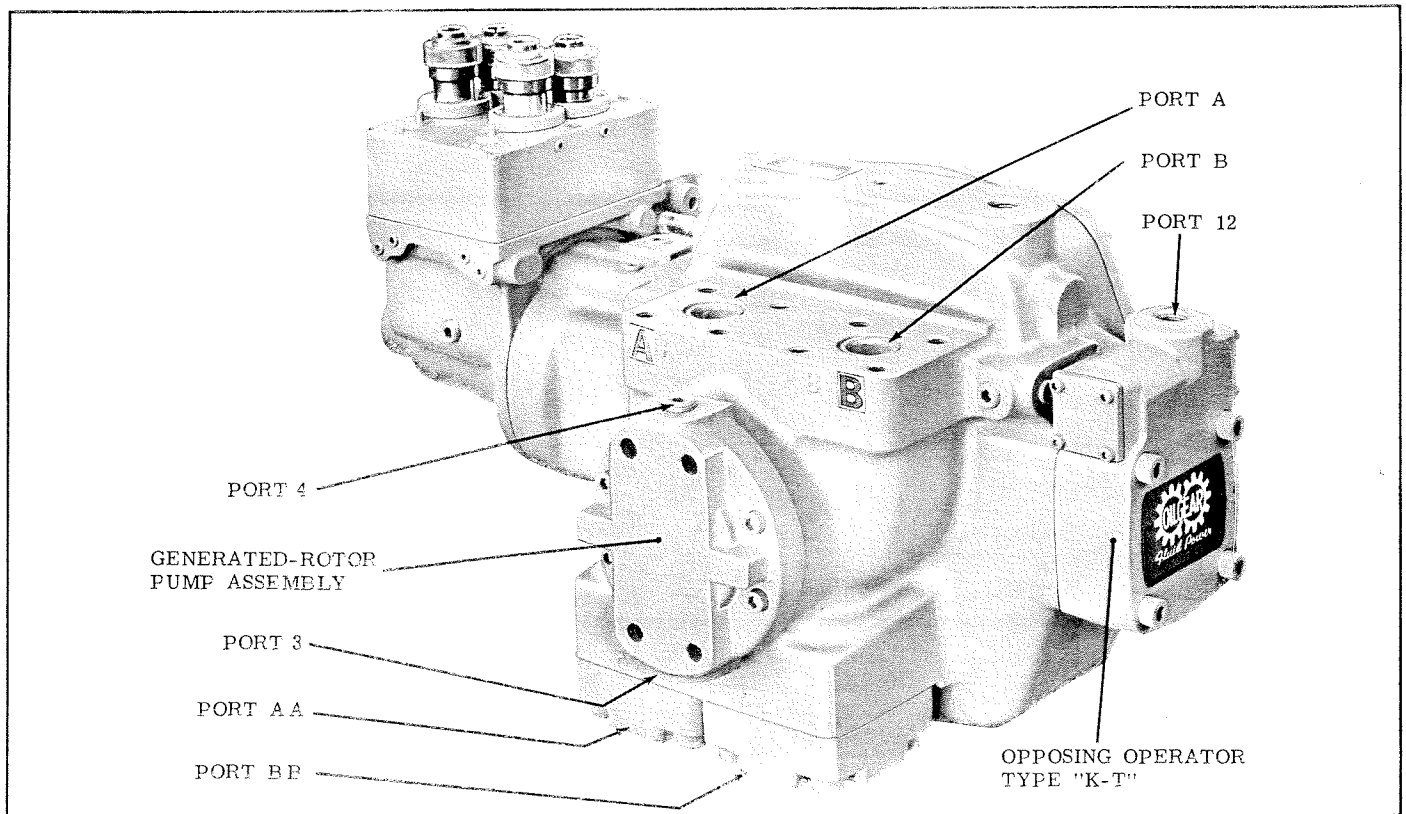


Figure 2. Oilgear Type "PVAKMZ-054-TMZ" Pump with Electric Multi-Position Control (54557).

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REFERENCE BULIETINS

PVA-054 Units w/o Controls----- 947065  
 Type "M-M" Controls----- 947290  
 Type "K-T" Opposing Operators----- DS-947045  
 Piping Recommendations-----90011

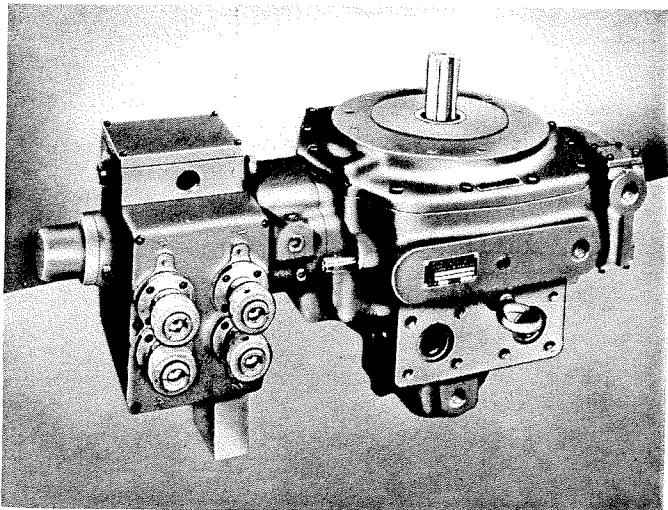


Figure 3. Pump on Table for Disassembly. (54585).

I. Handling Pump. Screw a 1/2" eye bolt in hole on top of case to lift unit with shaft in a horizontal plane. Screw two 1/2" eye bolts in front bearing housing to lift unit with shaft pointing upward. Insert a small block under control to support and level pump on work table (figure 3). Some units have been modified from those described in this bulletin.

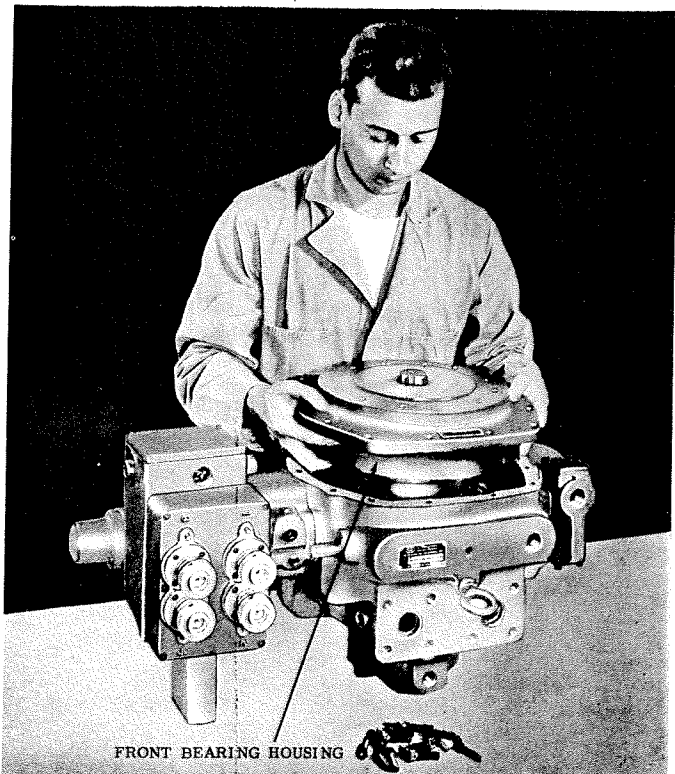


Figure 4. Replacing Pump Front Bearing Housing (54589).

II. Replacing Piston Pump\* Remove fourteen 3/8" screws and lift housing assembly over shaft (figure 4). Lift drive shaft, cylinder, pistons, wear plate and bearing assembly from case (figure 5). Apply a light coat of clean oil or grease to new wear plate face, be sure "Wear Surface" note faces away from

cylinder. Insert new shaft assembly in case. Be sure shaft slot fits over rear shaft coupling key. If necessary, use a new front housing gasket. Place front housing over shaft and fasten to case.

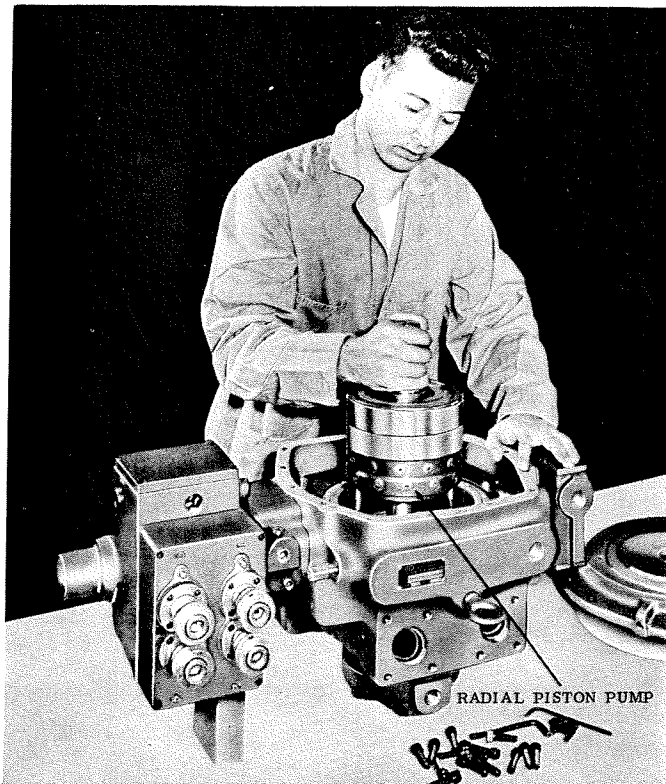


Figure 5. Replacing Piston Pump Assembly (54582).

III. Flat Valve Assembly. After removing piston pump assembly, (para. II) set pump at an angle and lift out flat valve assembly (figure 6). Compensating pistons (when used), hold-up pistons and springs may remain in valve. Lift out tumblers. Wipe valve assembly parts, including pistons and holes, thoroughly dry. Apply clean grease liberally to all parts and piston holes. Insert springs, pistons and tumblers in flat valve in this order. Insert flat valve in case with radial pin in guide slot. Lubricate flat valve wear surface. Be sure all parts remain in position and valve is level. Insert new shaft assembly and assemble front bearing housing (para. II).

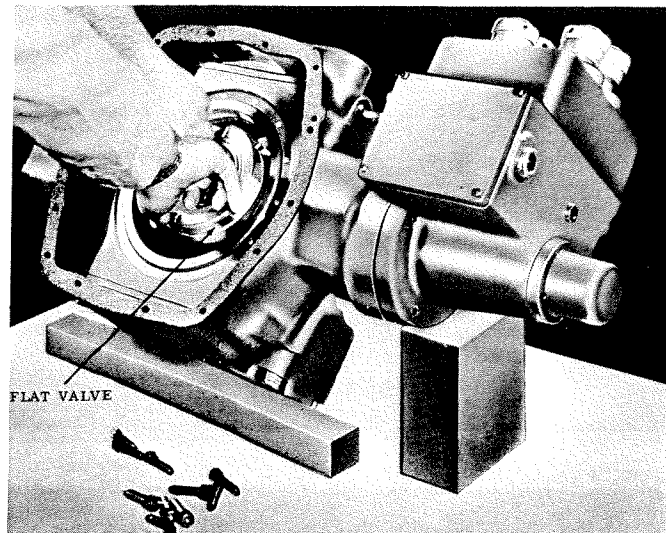


Figure 6. Replacing Flat Valve Assembly (54594).

IV. Replacing Generated Rotor Pump and Housing  
 Remove eight 3/8" socket head screws and lift off generated rotor pump housing assembly (figure 7). Check and replace O'ring, if necessary. Insert a new generated rotor pump and housing assembly. Be sure key in rear shaft fits into slot of main drive shaft. Fasten housing to case.

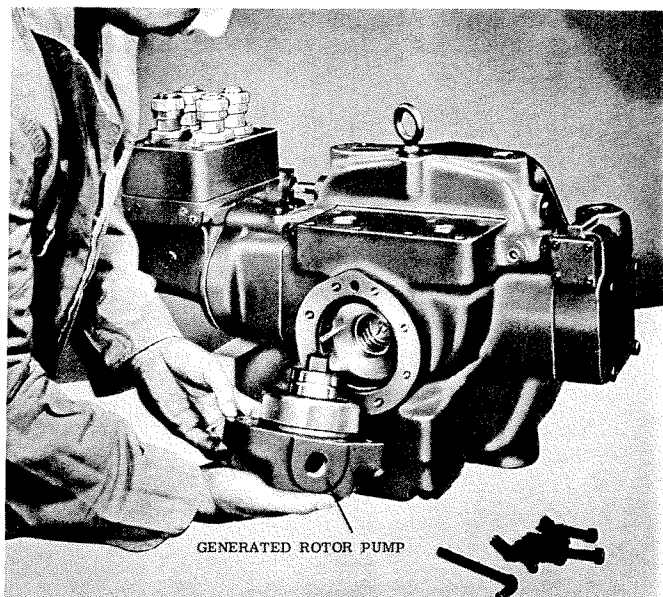


Figure 7. Replacing Generated Rotor Pump Housing Assembly (54586).

#### V. PRINCIPLE OF OPERATION

The control positions the radial piston slideblock assembly. When the vertical centerline of the cylinder and slideblock coincide (figure 8), "Neutral Position," the radial pistons do not move inward or outward in their bores as the cylinder and driveshaft assembly is rotated. No fluid is delivered.



High Pressure



Suction or Supercharge Pressure

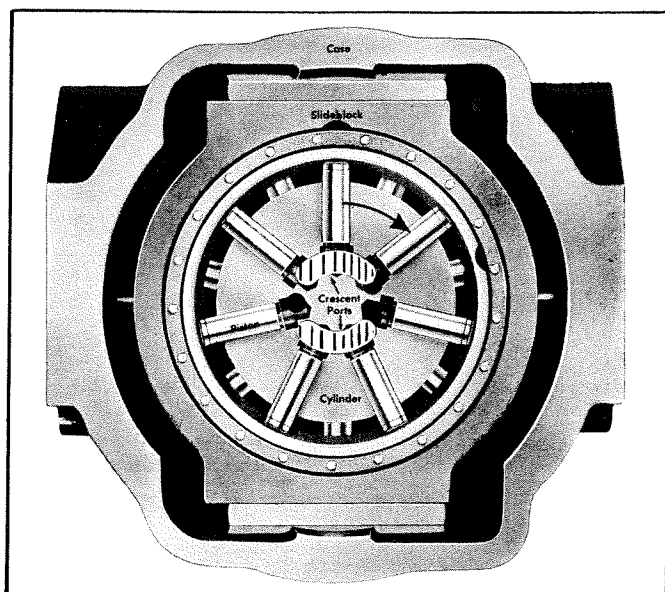


Figure 8. Slideblock in Neutral Position (54347).

\* Note: On early model units, front bearing spacer is fastened to the front housing. Drive shaft assembly and front housing are removed as one assembly.

When the slideblock assembly is moved eccentric to the cylinder centerline on the left (figure 9), the pistons move outward during the lower half revolution and draw fluid thru the lower crescent port of the flat valve, from port "B" (return) and/or port BB (suction). During the upper half revolution, the pistons move inward to deliver fluid thru the upper crescent port of flat valve to port "A". Bridges in the flat valve separate upper and lower crescent ports.

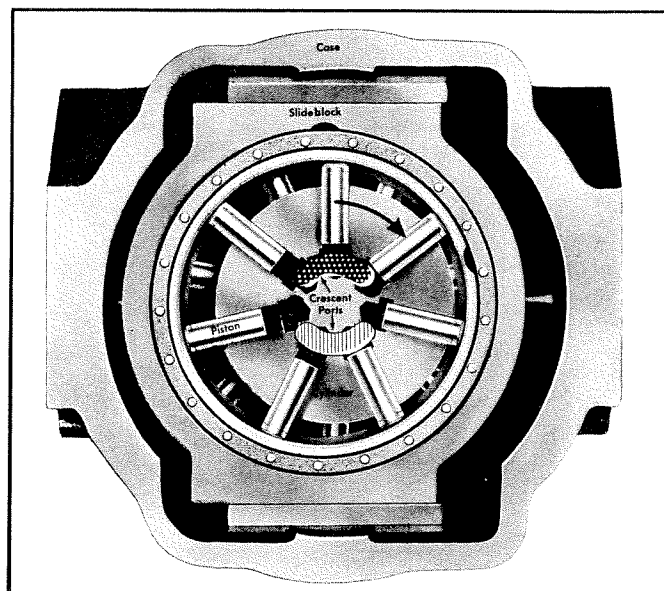


Figure 9. Slideblock to the Left (54349).

Moving slideblock assembly to the right of cylinder centerline (figure 10) reverses flow of fluid. Pump delivers fluid from port "B" and draws fluid from port "A" and from ports "AA" and "AB". The amount of fluid delivered by the radial piston pump is proportional to the amount of slideblock eccentricity.

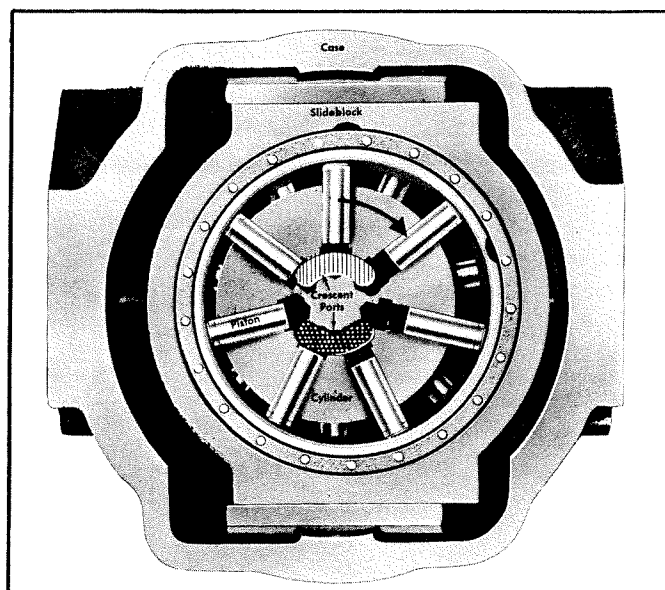


Figure 10. Slideblock to the Right (54348).

For complete pump operation, refer to figure 11. The low pressure, generated-rotor pump has a pair of gear shaped elements, one within the other. The inner rotor is keyed to the driveshaft and drives the outer (generated) rotor. Each meshing pair of teeth of the two elements engages at just one place in the pump. At the lower side of the point of mesh, pockets

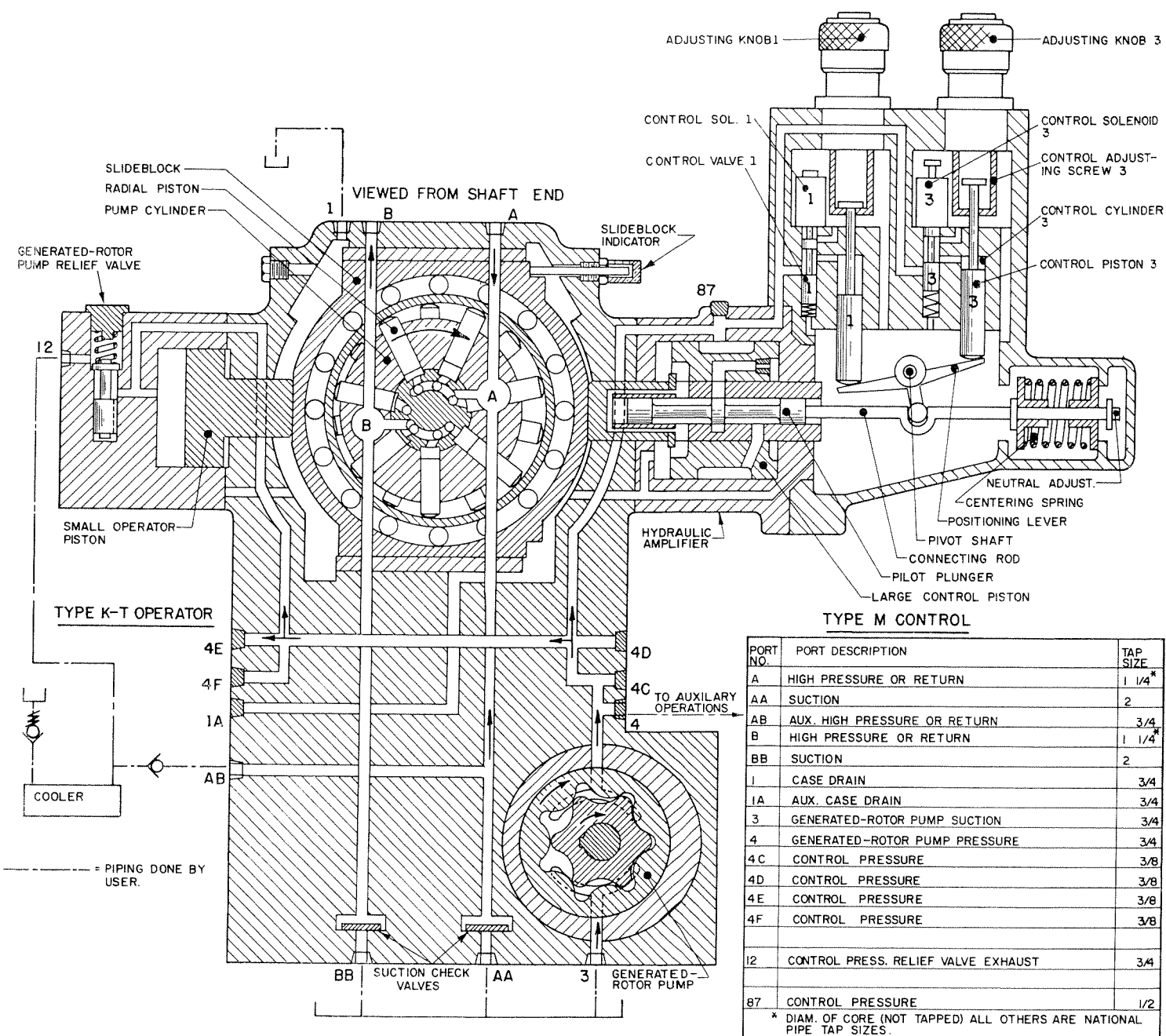


Figure 11. Schematic View of PVAKMZ-054-TMZ Pump (5V-10462-L).

of increasing size are formed as gears rotate, forming suction pockets. At the upper side of mesh, pockets decrease in size and discharge fluid. Low pressure fluid is ported internally to control and opposing operator, and to port 4 for operating auxiliary devices. A relief valve in opposing operator limits generated-rotor pump pressure for control and auxiliary operations.

Energizing solenoid (1) directs control fluid thru valve (1) to control cylinder (1) to force control piston downward. This force tilts the positioning lever and moves the connecting rod and pilot plunger to the right. The pilot plunger directs fluid from the area behind the large control piston to drain. Fluid behind the small operator piston moves the slideblock to the right until the large control piston and bushing again cover the pilot plunger "land" and seals fluid flow. On these units, volume controls 1 and 2 position the slideblock for delivery out port "B". De-energizing solenoid (1) connects control cylinder (1) to drain.

Energizing solenoid (3) depresses control valve plunger (3) and directs control fluid to control cylinder 3. Control piston (3) is forced downward until the collar of the adjusting screw stops movement (rotating adjusting knob raises or lowers this collar). The downward force tilts the positioning lever and moves the connecting rod and pilot plunger of hydraulic amplifier to the left. The pilot plunger directs control fluid to the area behind the large control piston. The force generated overcomes the small operator piston to move slideblock and large control piston to the left until the port in the bushing and piston are sealed by the pilot plunger "land." On these units, volume controls 3 and 4 position the slideblock for delivery out port "A".

With all solenoids de-energized (all control valves connect control cylinders to drain), the spring centering device returns the pilot plunger, hence, the slideblock to a point just off neutral.