

"P-1NN" PRESSURE COMPENSATOR CONTROL

(with 4-way pilot control valve)

Operation for a typical pump driven clockwise (right hand) is described. Cut-a-way diagrams are a representation of typical pumps with this control. **Actual coupling** of control to pump control pin and swashblock **varies** from pump type to pump type. But, **functionally**, the **swashblock** (and resultant delivery) is **positioned** by **two** opposite (acting) **control pistons** (although, in some cases, the [two] pistons may actually be a single [one] piece).

See individual control parts drawings for actual configuration and location of part assemblies, orifices, connections and ports.

I. PRINCIPLE OF OPERATION

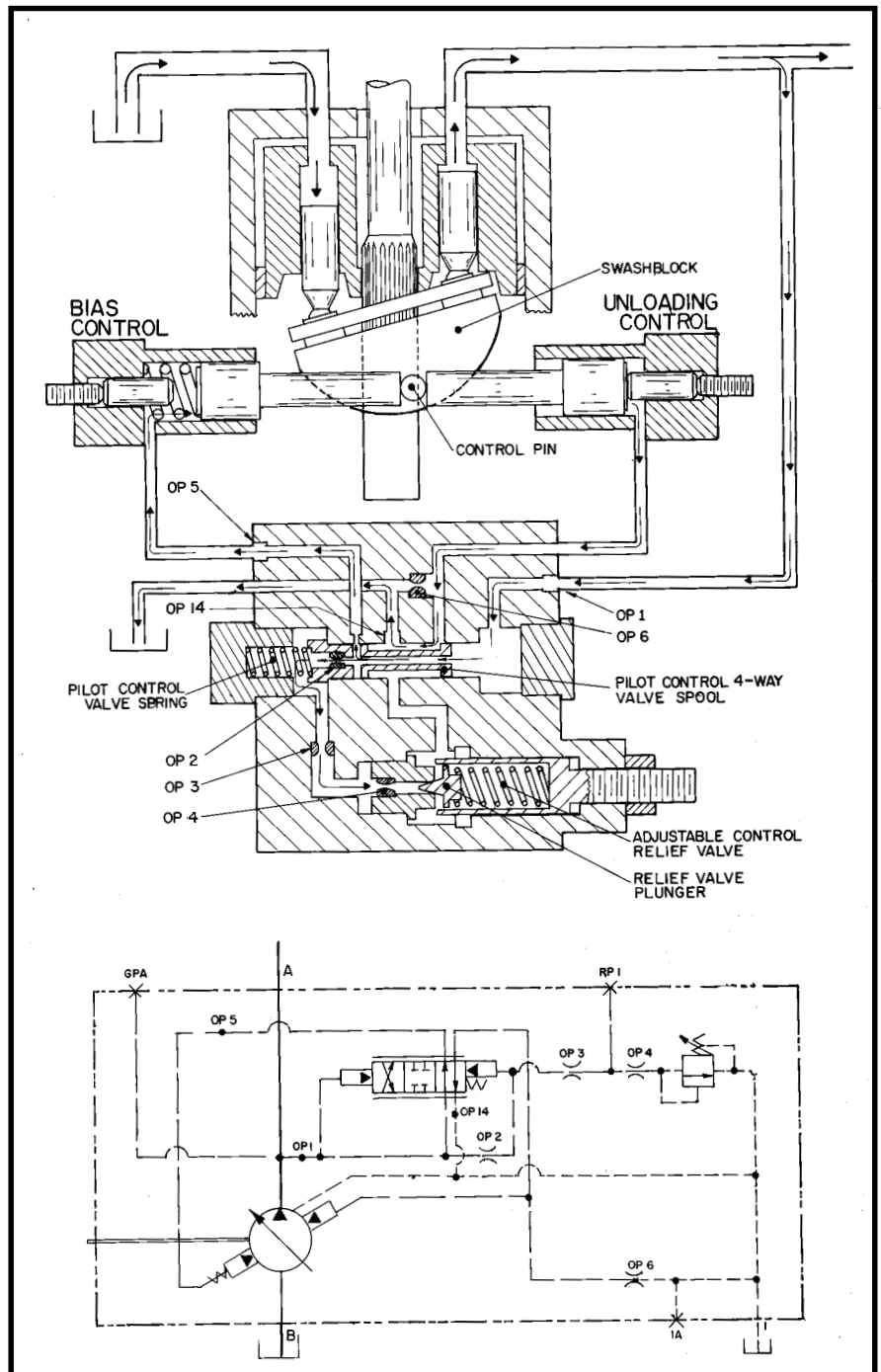
A. STARTING (See Figure 1 & 2)

The bias control piston spring positions the control and connected pump swashblock so the pump will deliver **maximum volume** to raise pressure in the system.

B. RAISING PRESSURE

Pump delivery (and resultant pressure) is fed back to the control through **Port "OP1"** (in some cases, an orifice may be installed in this port). The **four-way pilot control valve** is held in the "open" position by a **pilot control valve spring**. Flow (and resultant pressure) is transmitted through the pilot control valve spool to the area behind the **bias control piston** and through orifice **Port OP2**. Therefore, pressure acting on either end of the pilot control valve is equal, the **spool** is balanced and held in the open position by the **pilot control valve spring**. Flow (and resultant pressure) is also transmitted through **Port OP3** and **Port OP4** to the **adjustable control relief** (unloading) valve which blocks further flow in the control (and pressure transmittal).

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Figures 1 & 2. Raising Pump Pressure (5V-12125-L sh. 1).

C. PRESSURE COMPENSATING, pump unloading. (See Figures 3 and 4).

When pressure on the cone shaped **relief valve plunger** exceeds the presetting of the relief valve (set by turning in or out the relief valve screw which sets the tension or force, of the relief valve spring) the cone shaped plunger moves off its seat and allows flow through the valve, through drain line to pump case and case drain. Now, pressure is no longer acting on the spring end of the pilot control valve spool. Due to orifice in **Port OP2**, there is still pressure on the other end of the pilot control valve spool. This differential pressure forces the pilot control valve spool to shift and compress the pilot control valve spring. The pilot control valve spool now allows pump delivery (and resultant pressure) to flow to the **unloading control piston**. The pilot control valve spool simultaneously drains the fluid from behind the **bias control piston**.

The control piston now moves the **control pin** and shifts the **swashblock** to a position towards neutral where the pump (is unloaded) delivers "just enough" volume to maintain (make-up for component slip losses or leakage) system pressure as regulated by the adjustable control relief valve.

D. HOLDING PRESSURE (See Figures 1 and 2).

If the system pressure drops below preset compensating pressure (in the event of increased leakage of system components and/or opening of system valves etc.), the control relief valve conical plunger seats (stopping flow to drain), pressure (and force) on pilot control valve spool is (again) balanced, pilot control valve spring returns spool to original position (as shown in figures 1 and 2), swashblock position shifts, and pump is "stroked" for increased (towards full) delivery until the control relief valve preset pressure is reached again.

II. ORIFICE FUNCTIONS

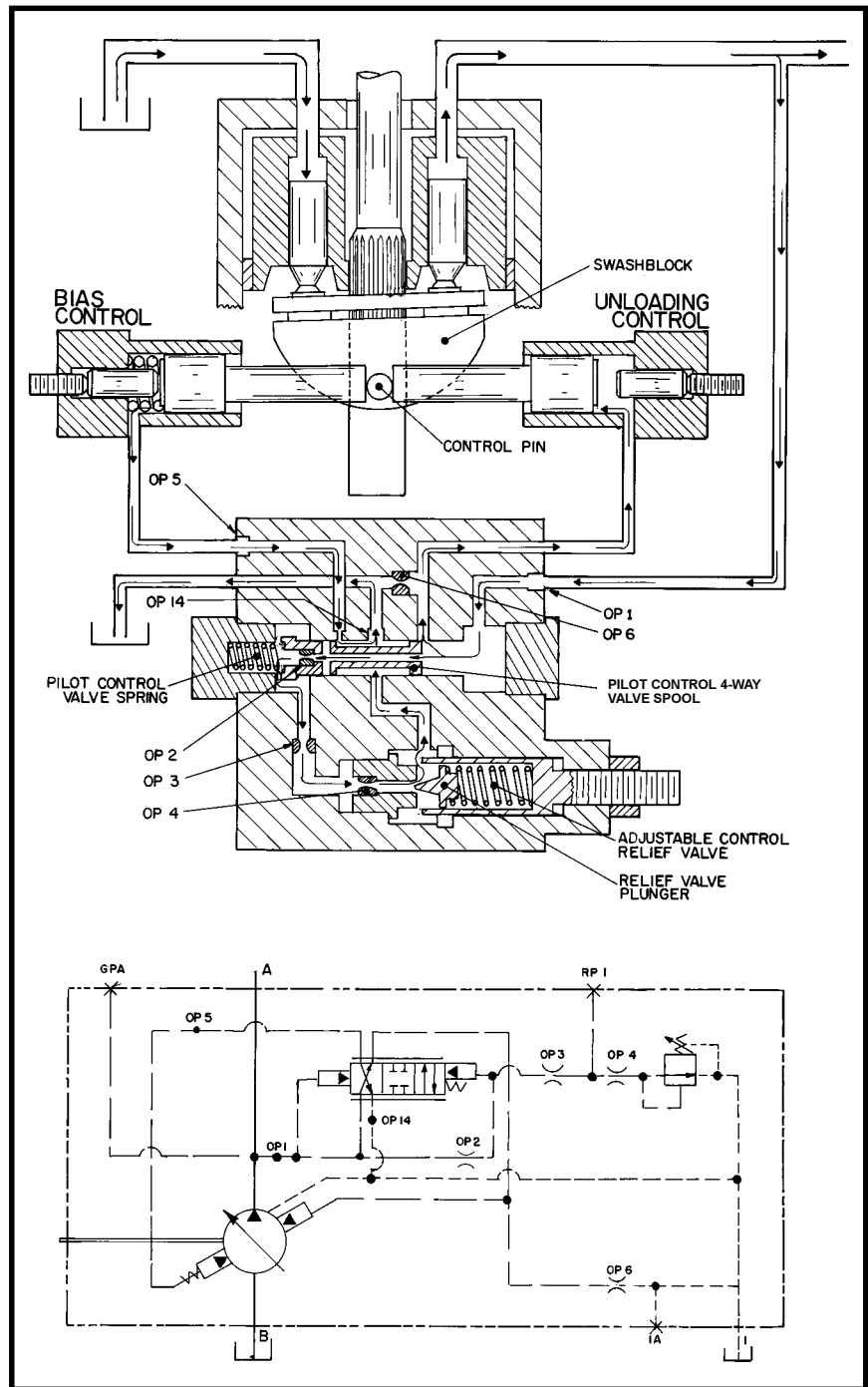
| Orifice No. | Decreasing Orifice Diameter will Result In:—(Increasing Diameter will Do the Opposite) |
|-------------|--|
| OP1 | Overall slowing of control response * |
| OP2 | Do not change size of orifice** |
| OP3 | Do not change - increased stability |
| OP4 | Do not change - increased stability |
| OP5 | Slowing of "off stroke" time ## |
| OP6 | Increased unstability # |
| OP14 | Slowing down of "on stroke" time. Do not go smaller than 0.060" |

* Orifice not used (standard)

** If this orifice becomes plugged, the control will hold pump on minimum stroke. Be sure orifice is not plugged.

Plugged on "PVK" pumps

Not used on "PVG" Pumps



Figures 3 & 4 Compensating Pump Delivery (5V-12125-L sh. 2).