

SERVICE INSTRUCTIONS

OILGEAR TYPE “VS” ELECTRONIC SERVO VALVE CONTROLS FOR “PVWH” and “PVW” PUMPS

PURPOSE OF INSTRUCTIONS

These instructions have been prepared to simplify and minimize your work of operating Oilgear type “VS” controlled units. This material will inform you as to basic construction, principle of operation and service parts listings. Some controls may be modified for special applications from those described and other changes may be made without notice.



Figure 1. Typical “VS” control for Oilgear “PVWH” and “PVW” pumps (99002).

REFERENCE MATERIAL

| | | |
|--|----------|--------|
| Fluid Recommendations | Bulletin | 90000 |
| Filtration Recommendations | Bulletin | 90007 |
| Piping Information | Bulletin | 90011 |
| “PVWH” and “PVW” Open-Loop Pumps | Bulletin | 947015 |
| “VSC4” 4-Way Servo Valves | Bulletin | 36115 |

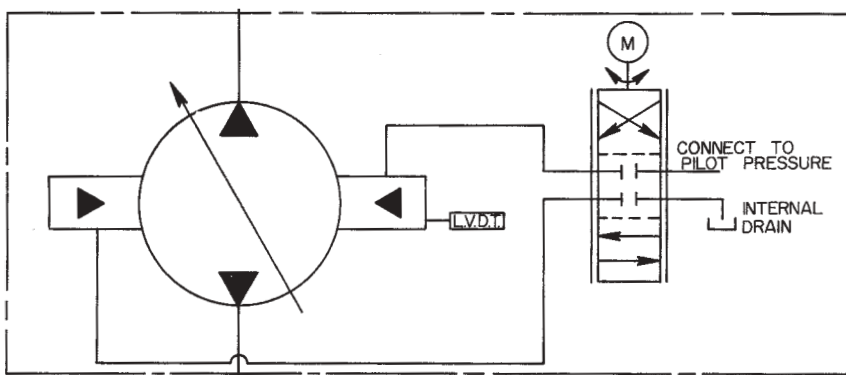


Figure 2. ASA diagram for “VS” controls shown with typical pump (510073).

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CONSTRUCTION

The "VS" control is mounted directly on the hydraulic unit and becomes an integral part of it. This control consists of an electro-hydraulic servo valve (342) ported to housing (368). The housing contains flow passages and a control piston (362). The control piston is connected to the swashblock via control pin (373). Therefore, changing the control piston position changes the units displacement. A linear variable differential transformer (LVDT) assembly (345) is connected to the control piston to electrically indicate control position (displacement).

PRINCIPLE OF OPERATION

See referenced Bulletin 36115 for the servo valve principle of operation.

NOTE:- the electronics for the "VS" control are a separate item and covered by other circuits and text.

Refer figure 3. The operation of the control begins with the adjustment of an electric "command" potentiometer to a new setting. The voltage from the "command" potentiometer is sensed by an electronic "VS" amplifier and is compared with the "feedback" voltage from the control's L.V.D.T. If the voltages are not the same, an "error" voltage is produced. The "error" voltage is amplified and used to actuate the servo valve torque motor.

The torque motor shifts the servo valve to connect one side of the control piston to pilot pressure and the other side of the con-

trol piston to drain. The control piston starts moving and changes the unit's displacement. The direction the servo valve moves depends upon whether there is a positive or negative "error" voltage.

The voltage from the "feedback" LVDT is also changing in direct proportion to the changing position of the control piston. When "feedback" voltage equals "command" voltage, the "error" voltage is zero. The torque motor centers the servo valve and blocks flow to and from the control piston chambers and the control piston movement stops and holds displacement.

Any further changes in position of command potentiometer or LVDT position (such as control piston "drift") will again initiate an "error" voltage and the same action (aforementioned) will take place until "error" voltage is zero.

CAUTION

On (one-way) open loop "PVWH" or "PVW" pumps, care must be exercised to prevent control from going past the neutral position (crossing over for delivery from the other port) or damage will result to pump and/or motor. Consider use of type "SA" minimum stop.

On (two-way) "PVWC" or "PVW" closed-loop (hydrostatic pumps), the control can provide controlled variable delivery from either port.

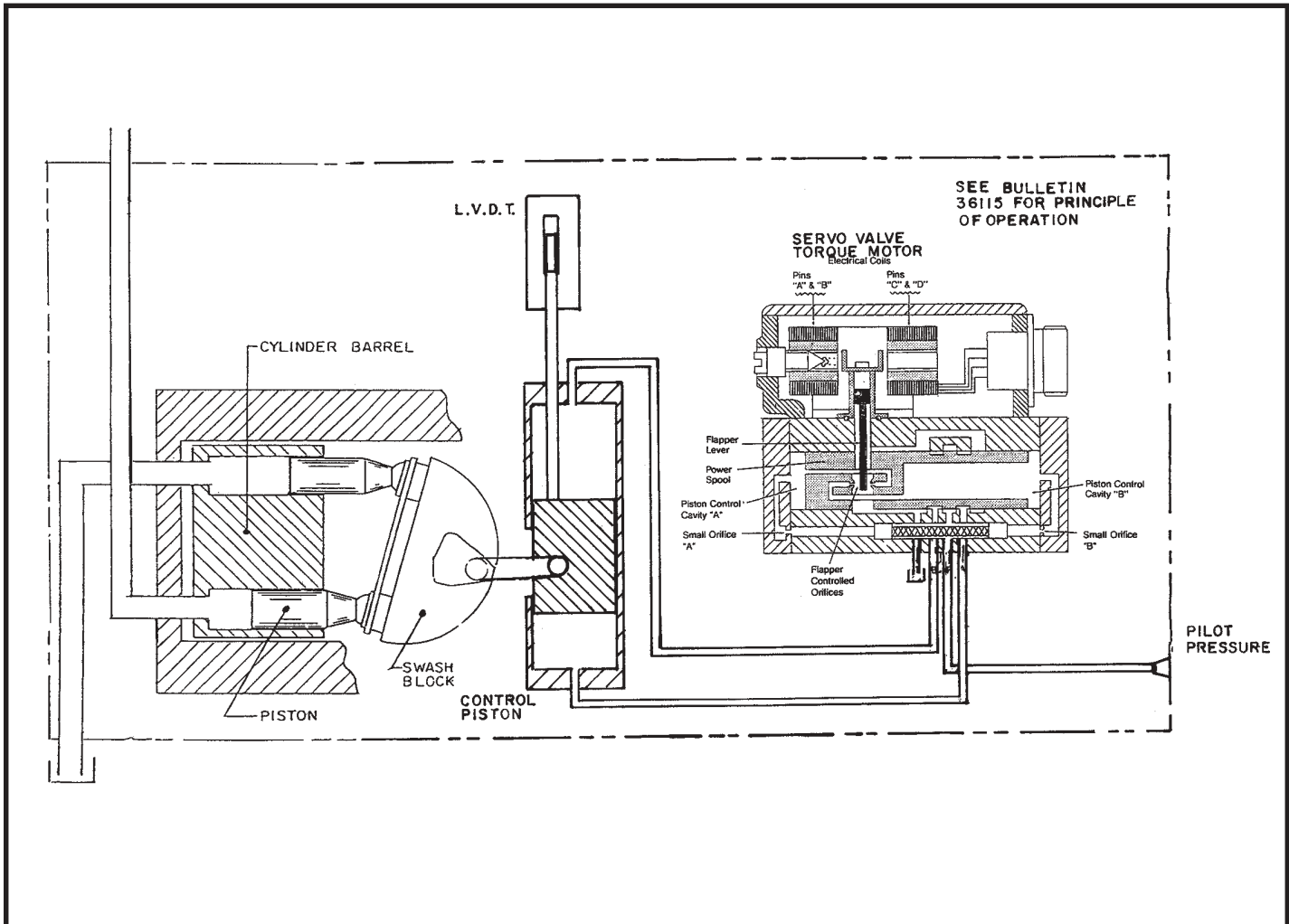
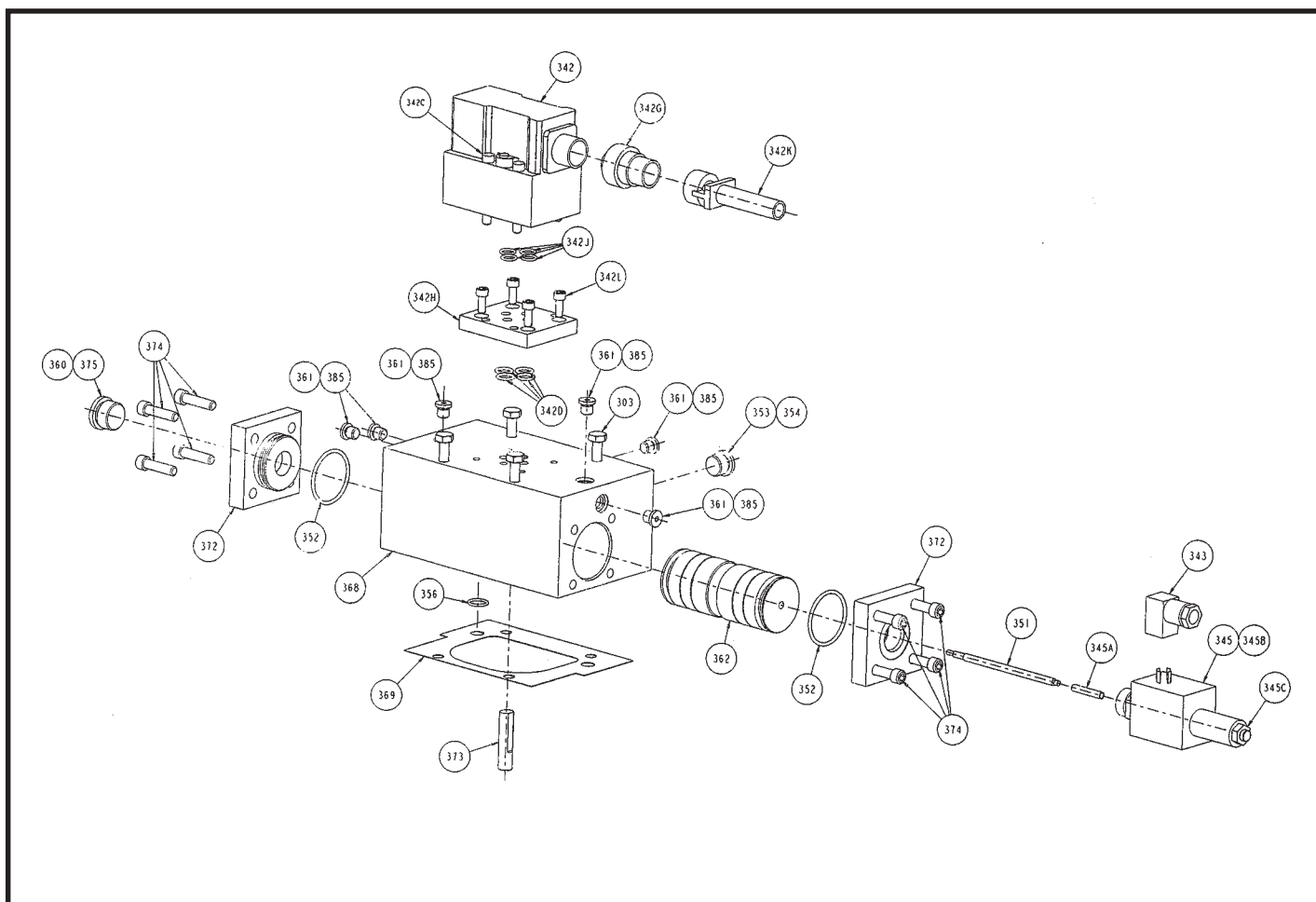


Figure 3. Cut-a-way Diagram of "VS" Control (E51902 sh. 6).



PARTS LIST

| ITEM NO. | DESCRIPTION | ITEM NO. | DESCRIPTION |
|------------|---------------------------|----------|------------------------|
| 303 | Screw, Hex. Hd. | 352 | Seal, O'ring |
| 342 | Assembly, Servo Valve | 353 | Seal, O'ring |
| 342C | Screw, Metric | 354 | Plug, SAE |
| 342D | Seal, O'ring | 356 | Seal, O'ring |
| 342G | Connector, Servo Cable | 360 | Plug, SAE |
| 342H | Plate, Adapter | 361 | Plug, SAE |
| 342J | Seal, O'ring | 362 | Piston, Control |
| 342K | Clamp & Boot, Servo Valve | 368 | Housing, Control |
| 342L | Screw, S.H.C. | 369 | Gasket, Control |
| 343 | Connector, L.V.D.T. Cable | 372 | Cover, Control Housing |
| 345 & 345A | L.V.D.T. and Core | 373 | Pin, Control Piston |
| 345B | Seal, O'ring | 374 | Screw, S.H.C. |
| 345C | Nut, Lock | 375 | Seal, O'ring |
| 351 | Stem, L.V.D.T. | 385 | Seal, O'ring |

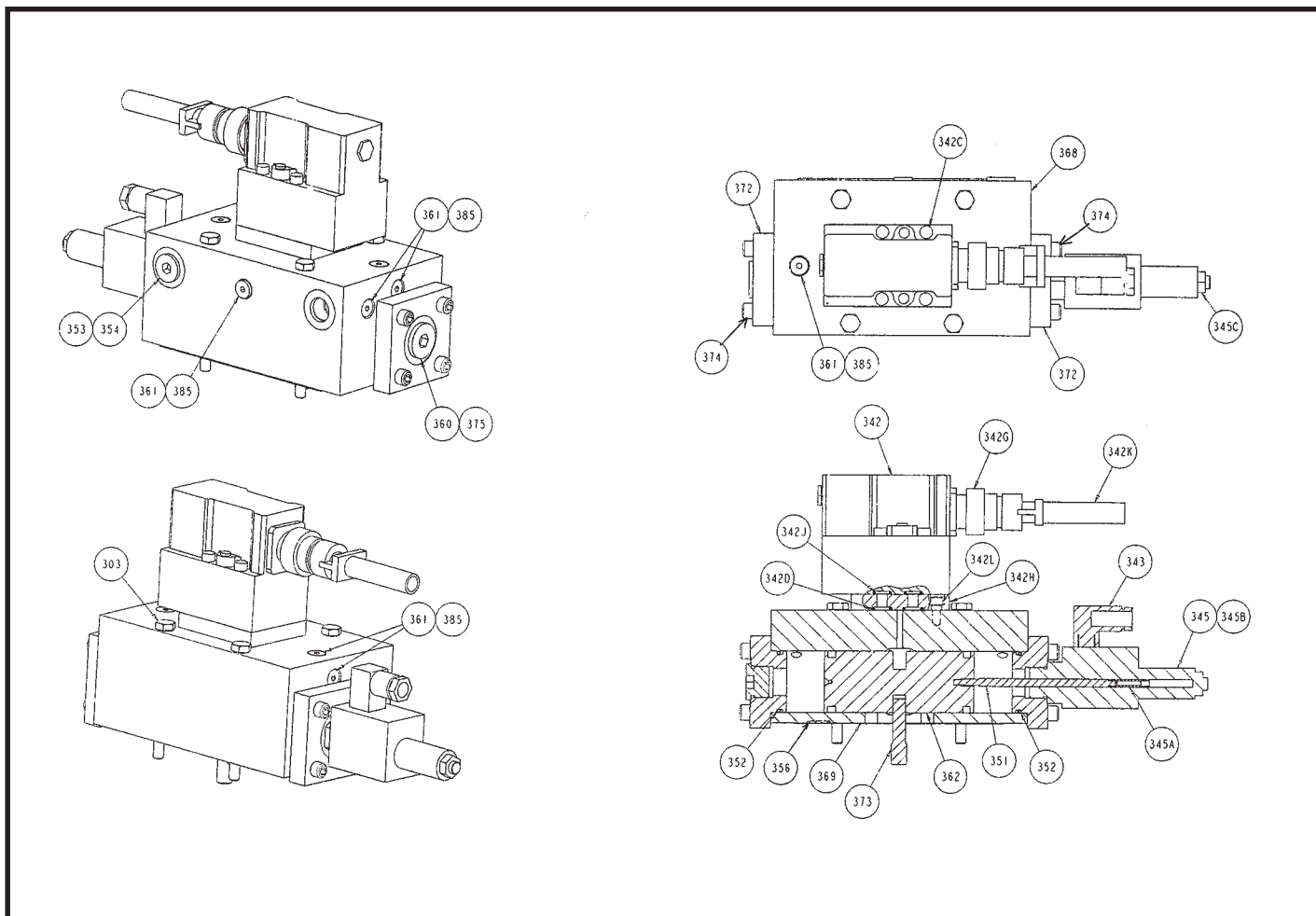


Figure 5. Parts Drawing, "VS" control, Plan View (E51902 sh. 1). Parts list on page 3.



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