MOOG

79-200 Series Installation and Operation Instruction

Electrohydraulic Servovalve

1. INTRODUCTION

This manual provides instructions and procedures necessary to install, operate and troubleshoot the Moog Inc. Series 79 Industrial Servovalve. Loop closure of the third stage spool requires external electronics – consult factory for suggested Moog model numbers.

2. OPERATION

The Moog Inc. Series 79-200 Industrial Servovalve consists of a two stage mechanical feedback pilot valve and a high flow third stage with electrical feedback. Proper operation requires the use of user provided electronics to condition the spool position transducer, compare actual spool position to command and to generate a current signal to the pilot valve.

In a typical system, a spool position command signal is compared to the actual spool position signal in the servoamplifier. The error (difference) is converted to a current signal and used to drive the pilot valve spool in the proper direction. The pilot valve spool directs oil flow to one end of the third stage spool, moving the spool. Spool movement is sensed by the spool position transducer and spool motion continues until the spool position signal is equal to the command signal. At this point, the servoamplifier current returns to near zero, the pilot valve returns to null and the third stage spool is held in position.

CAUTION

DISASSEMBLY, MAINTENANCE, OR REPAIR OTHER THAN IN ACCORDANCE WITH THE INSTRUCTIONS HEREIN OR OTHER SPECIFIC WRITTEN DIRECTIONS FROM MOOG WILL INVALIDATE MOOG'S OBLIGATIONS UNDER ITS WARRANTY.

3. HYDRAULIC SYSTEM PREPARATION

To prolong servovalve operational life and to reduce hydraulic system maintenance, it is recommended that the hydraulic fluid be kept at a cleanliness level of ISO DIS 4406 Code 16/13 maximum, 14/11 recommended. The most effective filtration scheme incorporates the use of a kidney loop or "off-line" filtration as one of the major filtration components. The filter for the "off-line" filtration scheme should be a $\beta_3 \geq 75$ filter for maximum effectiveness.

Upon system startup and prior to mounting the servovalve, the entire hydraulic system should be purged of built-in contaminating particles by an adequate flushing. The servovalve should be replaced by a flushing manifold and the hydraulic circuit powered up under conditions of fluid temperature and fluid velocity reasonably simulating normal operating conditions. New system filters are installed during the flushing process whenever the pressure drop across the filter element becomes excessive. The flushing processes should turn over the fluid in the reservoir between fifty to one hundred times.

To maintain a clean hydraulic system, the filters must be replaced on a periodic basis. It is best to monitor the pressure drop across the filter assembly and replace the filter element when the pressure drop becomes excessive. In addition to other filters that are installed in the hydraulic circuit, it is recommended that a large capacity, low pressure $\beta_3 \geq 75$ filter be installed in the return line. This filter will increase the interval between filter element replacements and greatly reduce the system contamination level.

4. INSTALLATION

The Moog 79 Series Industrial Servovalve may be mounted in any position, provided the servovalve pressure, control, and return ports match respective manifold ports.

Caution: If the servovalve is mounted vertically, the third stage spool may drift to one side when hydraulics are shut off. This may result in sudden movement of equipment when starting up.

The mounting pattern and port location of the servovalve is shown on Figure 2. The servovalve should be mounted with $^5/_8$-11 x 2.5 inch long high strength socket head capscrews. Apply a light film of oil to the screw threads and torque to 250 foot pounds.

On selected models, the pilot valve supply and return may be supplied through external lines attached to the valve body or an intermediate manifold. High response valves with stub shafted spools will require the installation of a drain line to the non transducer end cap.

Wire mating connector for desired coil configuration and polarity. Thread connector to valve.

5. MECHANICAL NULL ADJUSTMENT

There is no mechanical null adjust. Typically, a bias potentiometer is provided on the electronics to null the valve. If adjustment of the transducer is required, refer to the proper steps below.

Non Stub Shafted valves and older model Stub Shafted valves:

a. Remove the two socket head capscrews holding the transducer cover to the end cap. Carefully remove cover to prevent damage to the transducer wiring.
b. Loosen the jam nut using a $1^5/_8$ open end wrench.
c. Adjust transducer case to achieve required transducer null voltage.
Caution: Limit adjustment to ±2 turns. Excess loosening of transducer case will result in the release of hydraulic fluid.
d. Tighten jam nut. Replace transducer cover, being careful not to damage the transducer wires, using two socket head capscrews with lockwashers. Torque to 24 inch pounds.

Stub Shafted (High Response) Valves

a. Remove two socket head capscrews and lockwashers holding the transducer cover to the end cap. Carefully remove cover to prevent damaging the transducer wiring.
b. Loosen the set screw on the locking collar using a $^9/_{64}$ Allen wrench.
c. Rotate the locking collar to achieve the required transducer voltage.
d. Tighten the locking collar set screw.
e. Reinstall cover with screws and lockwashers.

Tools and Equipment

a. Metric Allen wrench set
b. Standard Allen wrench set
c. Open end wrench

Table 1. Replacement Parts

Part Description	Qty.	Part Number
Base O-Rings	4	42082-264

6. GENERAL SERVICING RECOMMENDATIONS

a. Disconnect electrical lead to servovalve.
b. Relieve hydraulic system of residual pressure.
c. Remove servovalve.

7. TROUBLESHOOTING CHART

The following troubleshooting chart list potential troubles encountered, probable causes, and remedies.

Potential Trouble	Probable Cause	Remedy
Servovalve does not follow input command signal. (Actuator or components are stationary or creeping slowly.)	1. Plugged pilot valve filter. 2. Contaminated third stage.	1. Replace pilot valve filter. 2. Return to factory for service.
High threshold. (Jerky, possible oscillatory or "hunting" motion in closed loop system.)	1. Plugged pilot valve filter. 2. Contaminated third stage.	1. Replace pilot valve filter. 2. Return to factory for service.
Poor response.	Partially plugged pilot valve filter.	Replace pilot valve filter.
Valve spool hardover.	1. Contaminated pilot valve. 2. System polarity reversed.	1. Return to factory. 2. Verify system polarities.

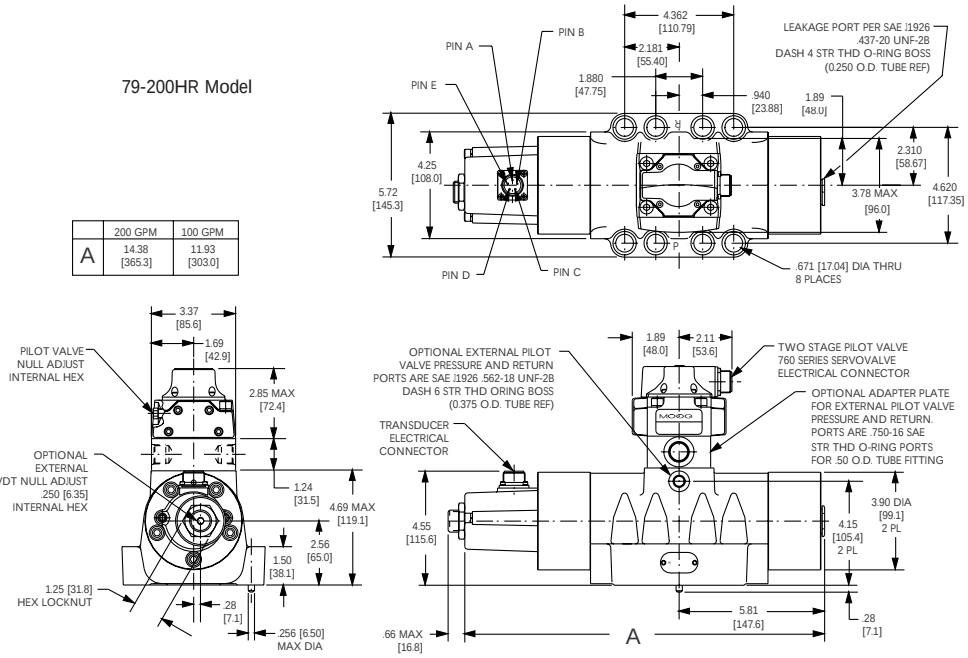
8. FUNCTIONAL CHECKOUT AND CENTERING

a. Install servovalve on hydraulic system or test fixture, but do not connect electrical lead.
b. Apply required system pressure to servovalve and visually examine for evidence of external leakage. If leakage is present and cannot be rectified by replacing O-Rings, remove the discrepant component and return for repair or replacement.
c. Connect electrical lead to servovalve and check phasing in accordance with system requirements.

9. AUTHORIZED REPAIR FACILITIES

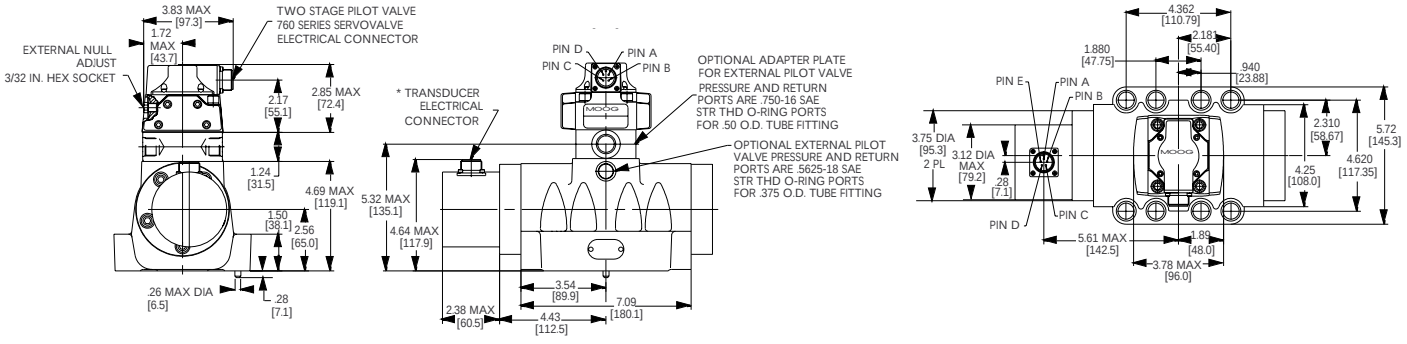
If servovalve continues to malfunction after all recommended corrective action procedures are performed, defective valve should be returned to Moog for repair. Moog does not authorize any facilities other than Moog or Moog subsidiaries to repair its servovalves. It is recommended you contact Moog at (716)655-3000 to locate your closest Moog repair facility. Repair by an independent (unauthorized) repair house will result in voiding the Moog warranty and could lead to performance degradation or safety problems.

79-200HR Model



	200 GPM	100 GPM
A	14.38 [365.3]	11.93 [303.0]

79-200 Model



Typical Manifold

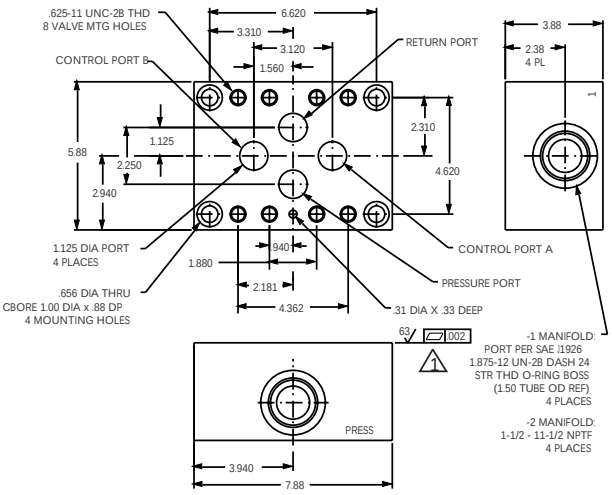


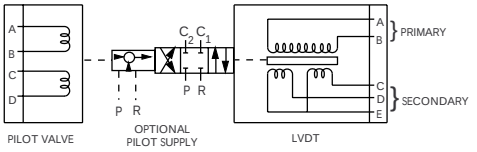
Figure 2

NOTES

1 Surface:
Surface to which valve is mounted requires 63 [▽▽] finish, flat within .002 [0.05] TIR.

2 Replacement O-Rings:
(Buna N 90 durometer)
Power Stage Base: (4 req'd) P/N 45122-264
Pilot Stage Base: (4 req'd) P/N 45122-22
Optional Pilot Supply Manifold: (3 req'd) P/N 45122-22; (1 req'd) P/N 45122-8

TYPICAL WIRING SCHEMATIC



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