

Servocontrol, failsafes and hydraulic servo valves

C. Marone & C. Wood

Techniques of Geophysical Experimentation

26 Mar. 2021

Servo valve

Legacy Product - 760 Series Servo Valves Direct-Operated Flow Control for Analog Signals



- 2-stage flow control mechanical feedback valve
- Nozzle flapper pilot stage for high dynamics, high resolution and low hysteresis
- High spool driving forces, rugged design ensures long-life operation
- Compact design allows applications with limited footprint

Specifications

Hydraulic Data

Rated Flow* 0.5 to 60 l/min (0.125 to 15 gpm)

Standard Configurations 5, 10, 20, 40, 60 l/min
(1, 2.5, 5, 10, 15 gpm)

Max. Operating Pressure 210 bar (3,000 psi)

Performance Data

100% Step Response** 4 to 16 ms

Frequency Response*** 115 to 215 Hz

Electrical Data

Rated Signal**** 8 to 200 mA

Standard Configurations 8, 15, 40, 60, 200 mA

Physical Data

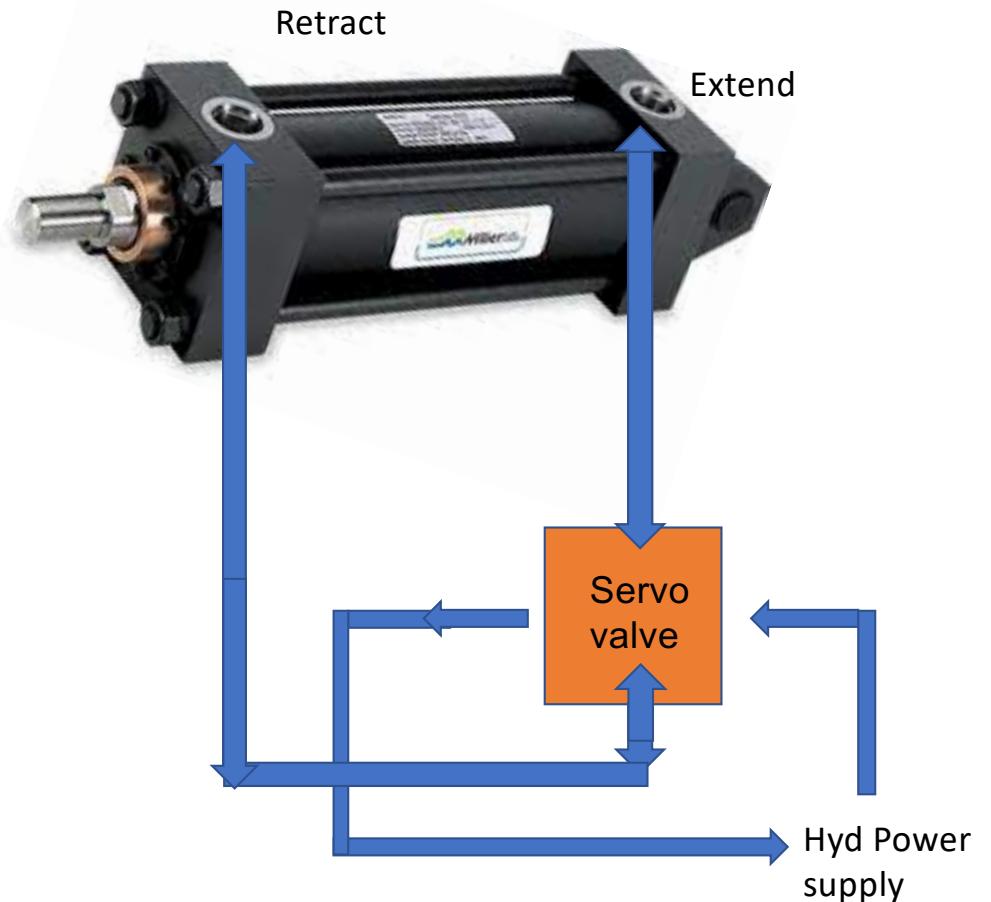
Size (Mounting Pattern) Size 04 (ISO 10372-04-04-0-92)

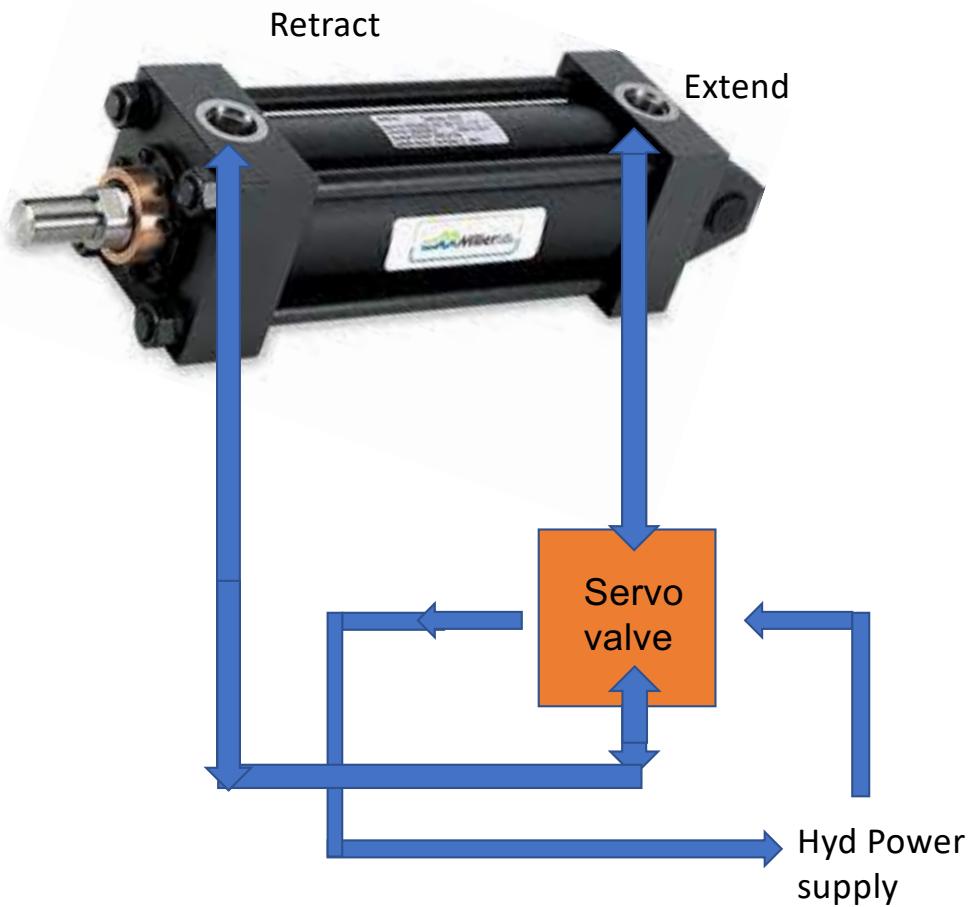
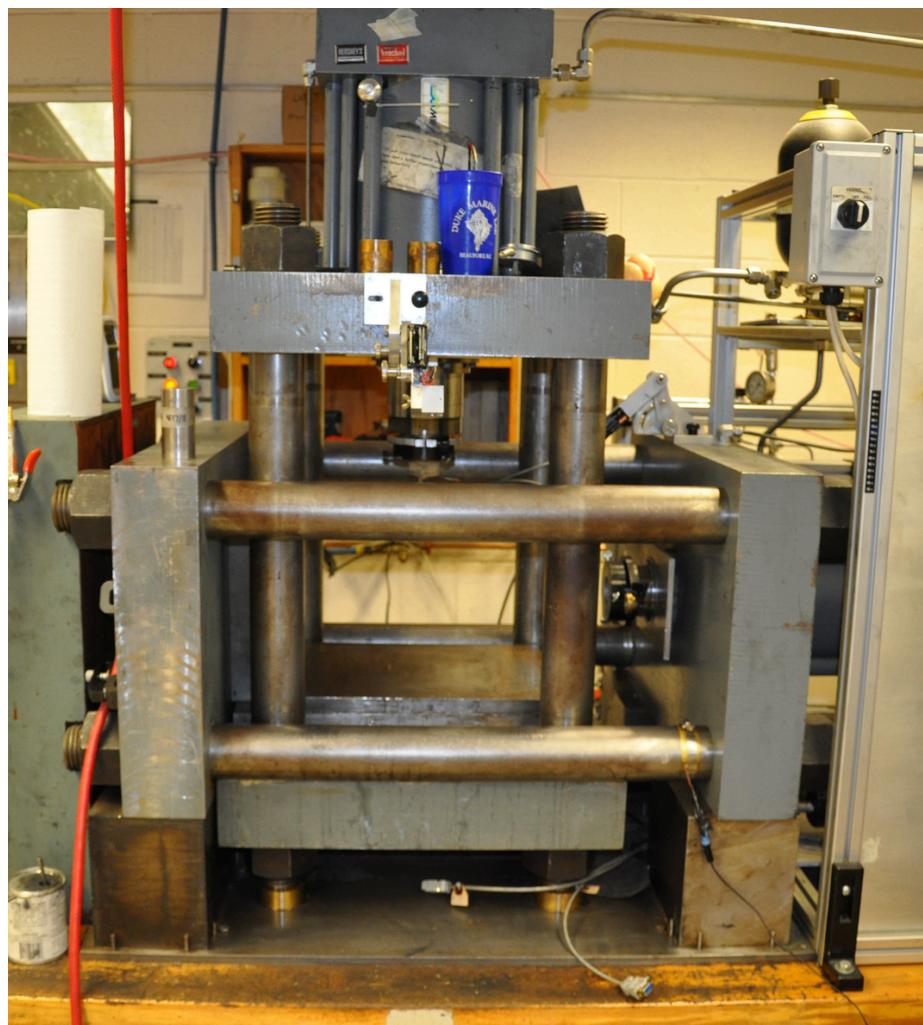
Servo valve

Legacy Product - 760 Series Servo Valves
Direct-Operated Flow Control for Analog Signals

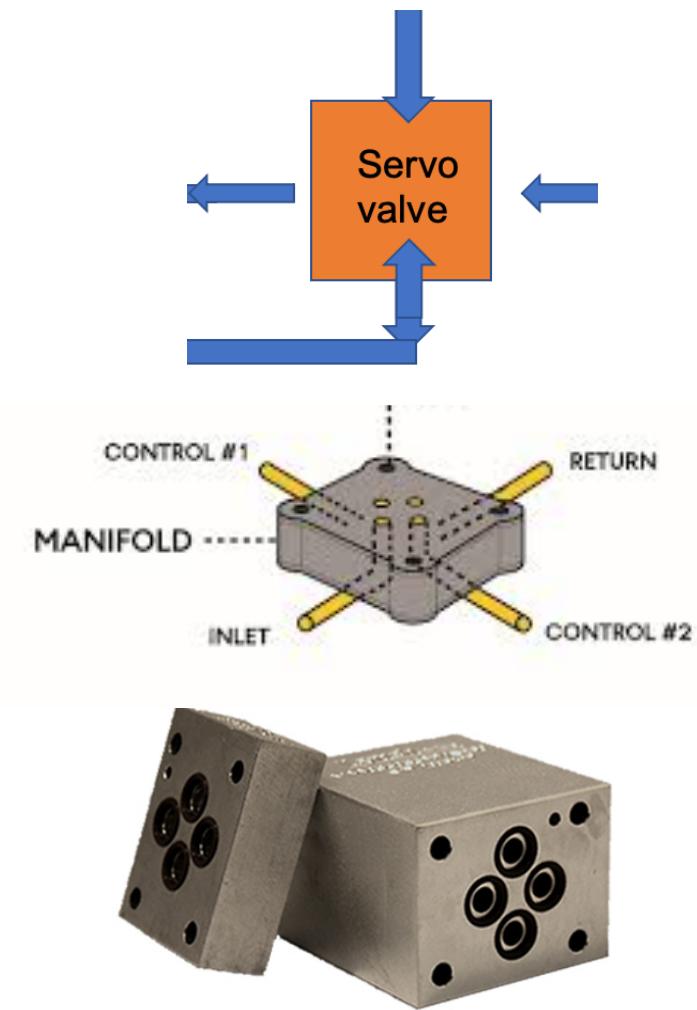


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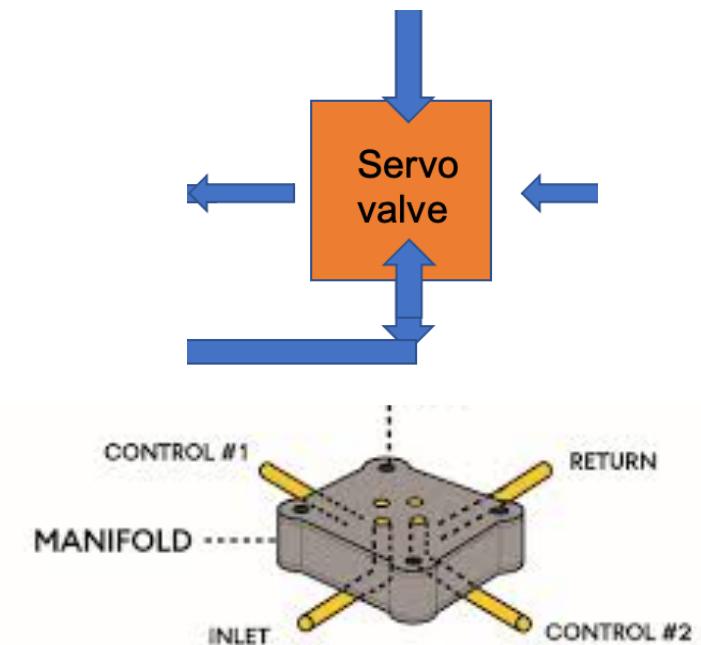
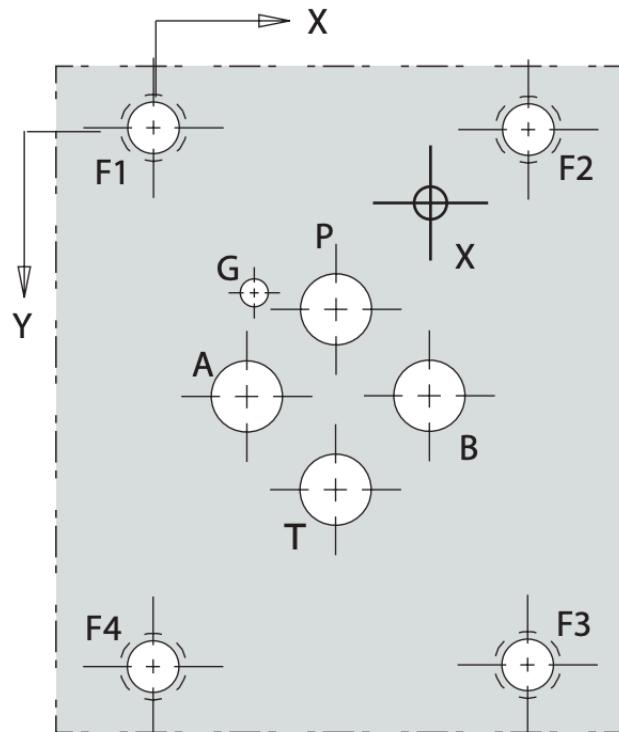


<https://personal.ems.psu.edu/~cjm38/biax.install.html>

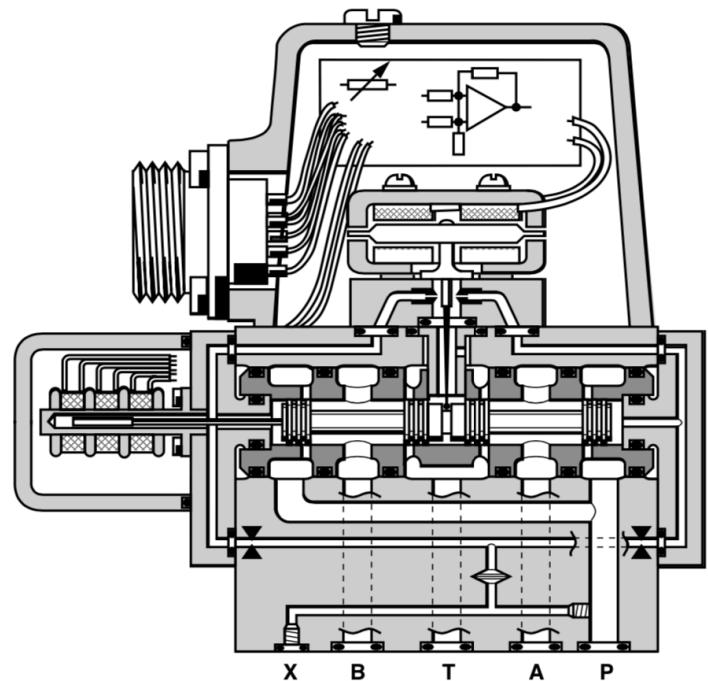


Servo Valve Manifold

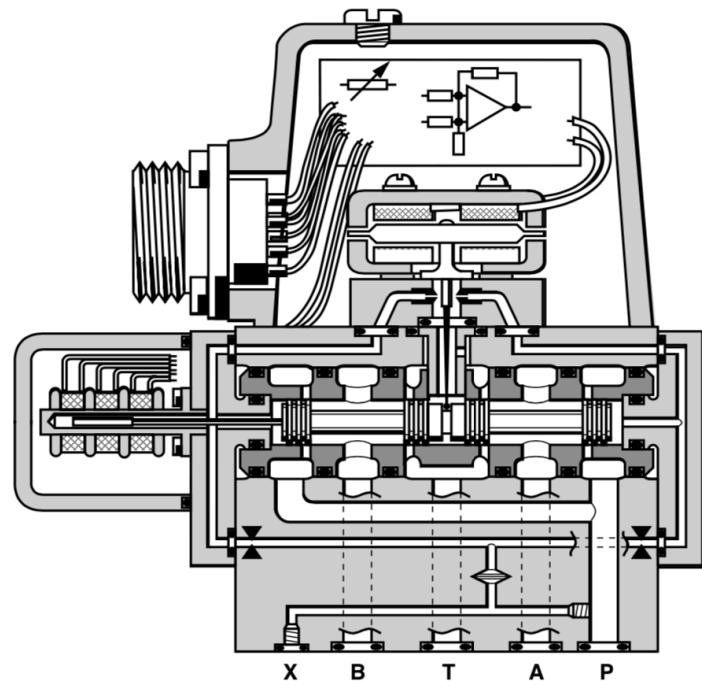
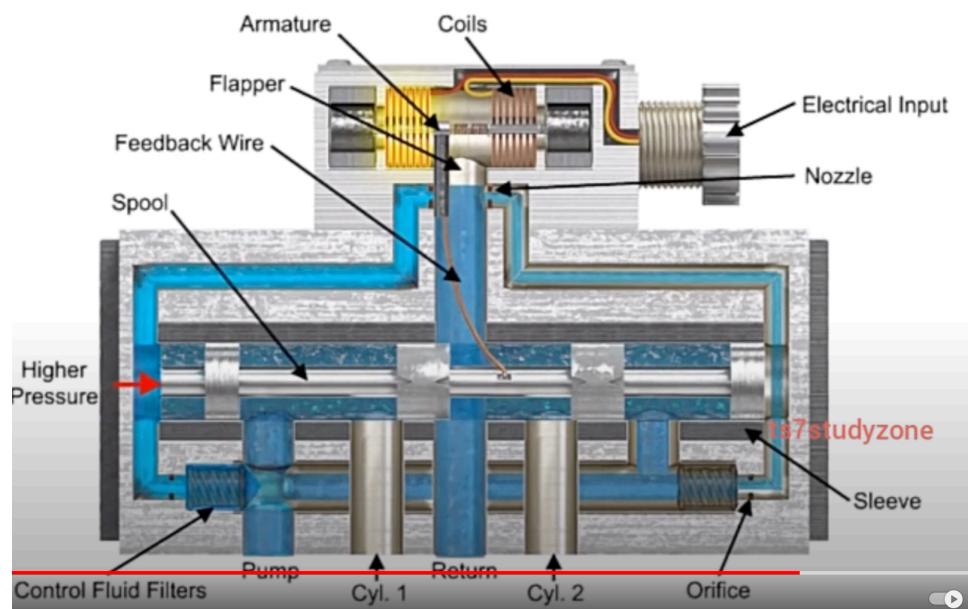
HOLE PATTERN OF MOUNTING SURFACE



Servo valve



Servo Control Valves

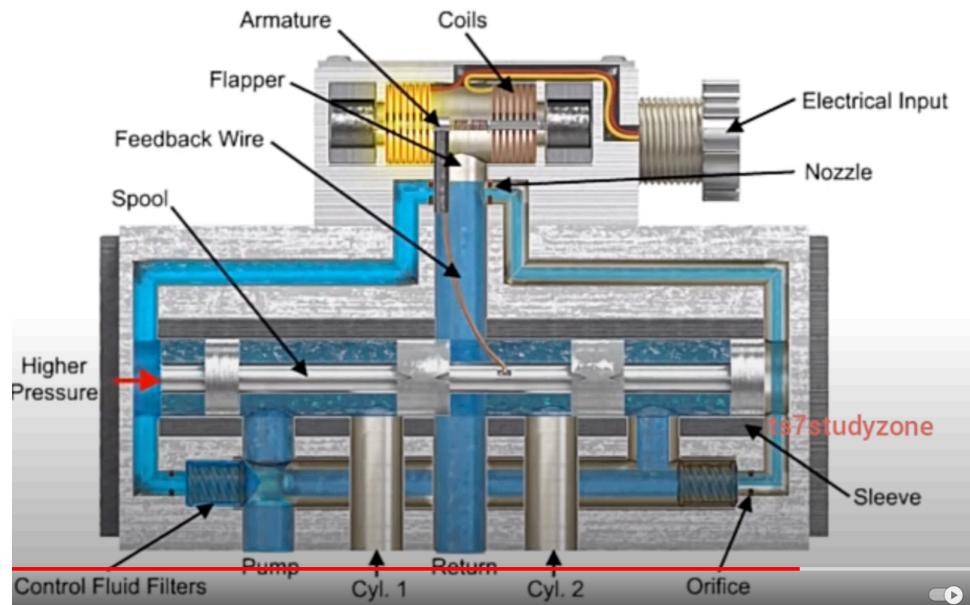


https://www.youtube.com/watch?v=Y4j_uGRPYes

<https://www.youtube.com/watch?v=q1labA0dx0M>



Servo Control Valves

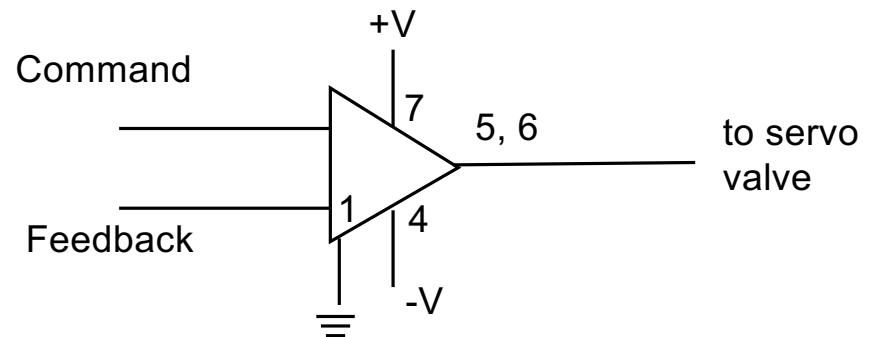


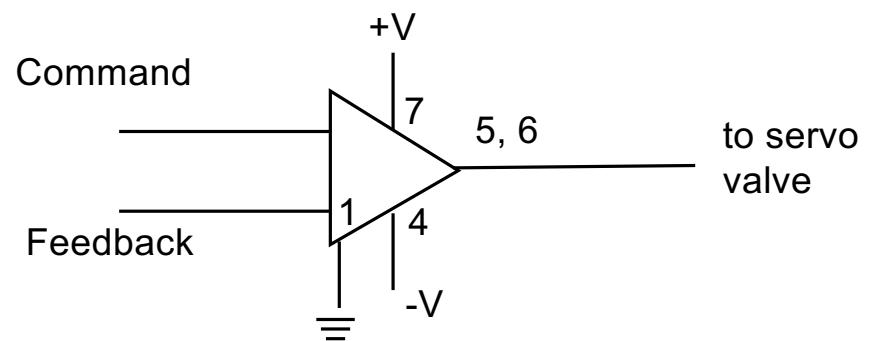
Biax

Let's look at the vertical ram

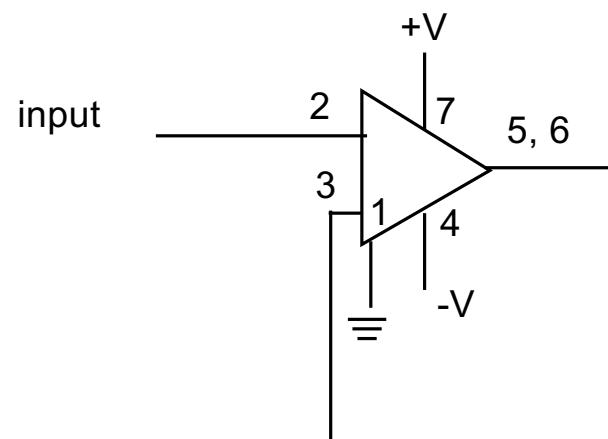
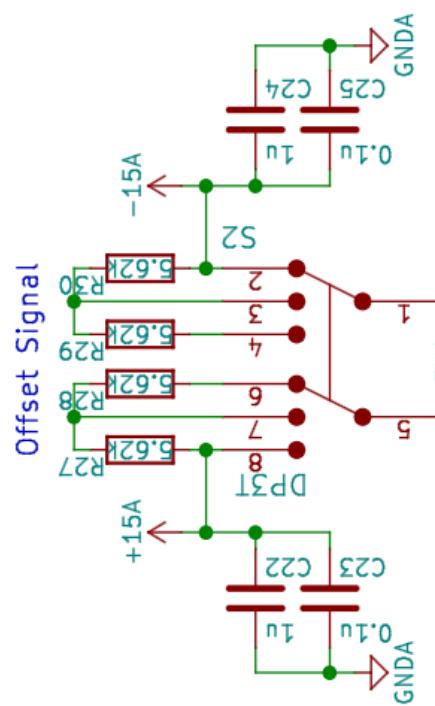
Where can the command originate?

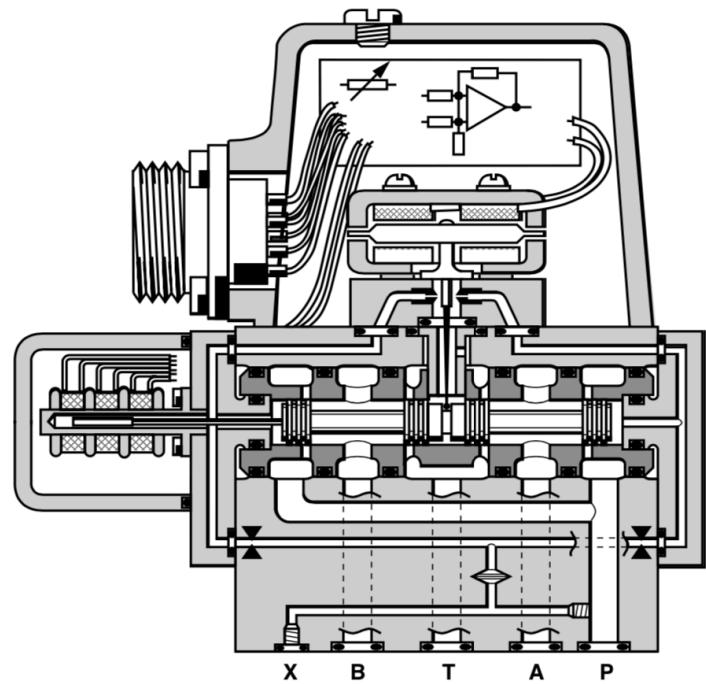
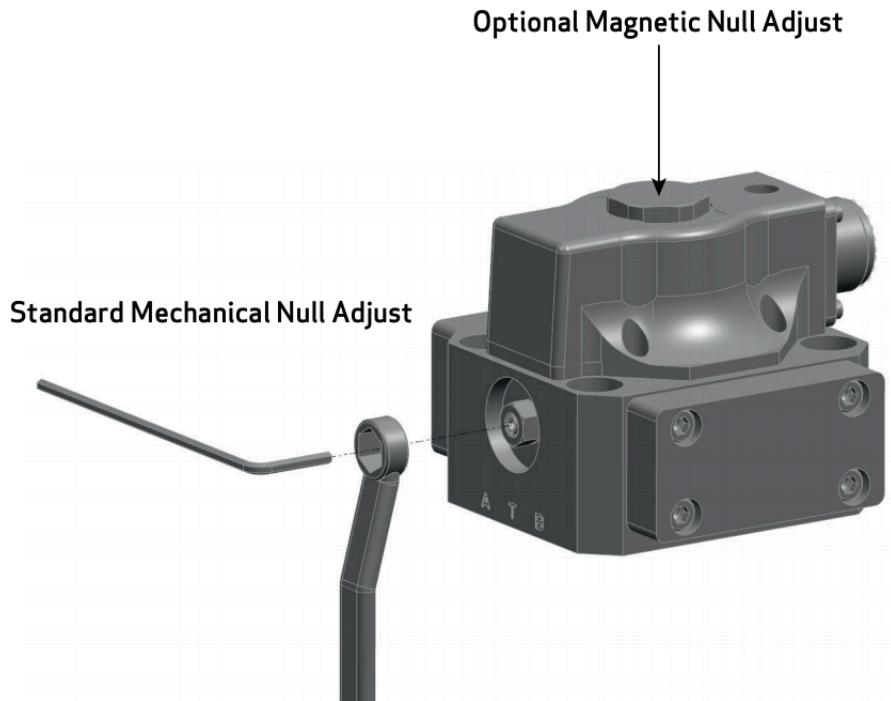
Where can the feedback originate?

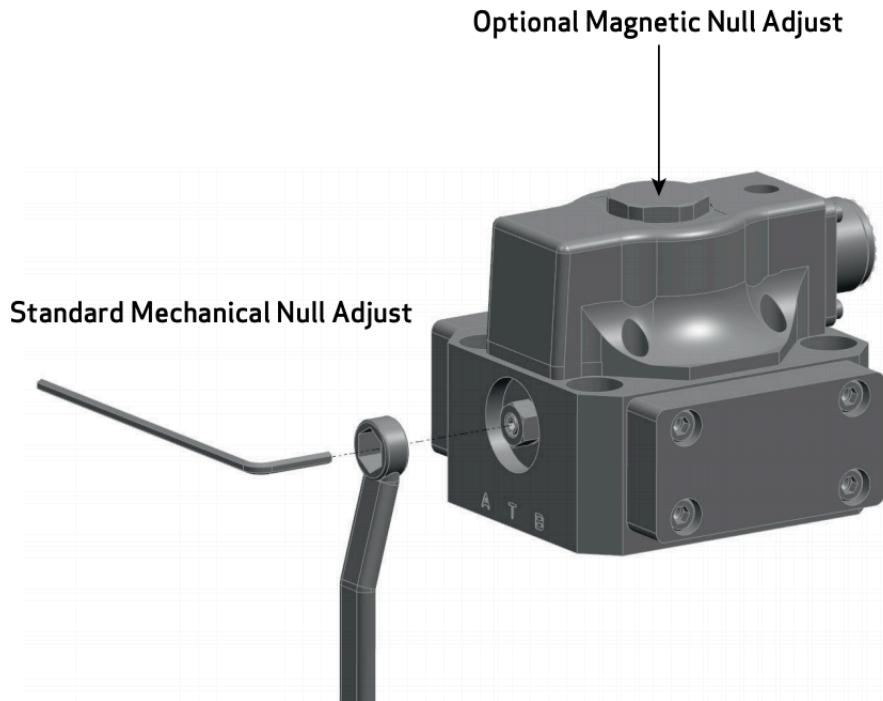




Diff. Amp, e.g. INA105







NUL FLOW ADJUSTMENT

It is often desirable to adjust the null flow of a Servo Valve independently of other system parameters. Valves with mechanical null adjustment allow for at least $\pm 10\%$ adjustment of null flow. The mechanical null adjustment is an eccentric bushing retainer pin, located above the tank port designation on the valve body, which if rotated provides control of the bushing location. Mechanical feedback elements position the spool relative to the valve body for a given input signal. Therefore, a movement of the bushing relative to the body changes the null flow.

Mechanical Adjustment Procedure

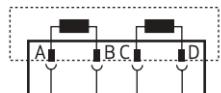
With zero current (electrical connector disconnected). Using a 3/8 inch offset wrench, loosen the self-locking fitting until the null adjustor pin can be rotated. (This should usually be less than 1/2 turn). DO NOT remove the self-locking fitting. Insert a 3/32 inch Allen wrench in the null adjustor pin. Use the 3/32 Allen wrench to rotate the mechanical adjustor pin to obtain the desired null flow. Re-torque the self-locking fitting to 57 in lbs.

Coil Connections

A 4-pin electrical connector that mates with an MS3106F14S-2S is standard. All 4 torque motor leads are available at the connector so that external connections can be made for series, parallel or differential operation. G761/761 Series Servo Valves can be supplied on special order with other connectors or pigtail.

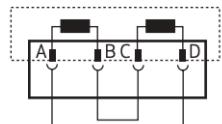
Configuration for valve opening P → B, A → T

Single



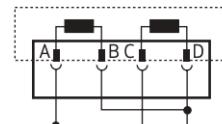
A (+), B (-) or C (+), D (-)

Series

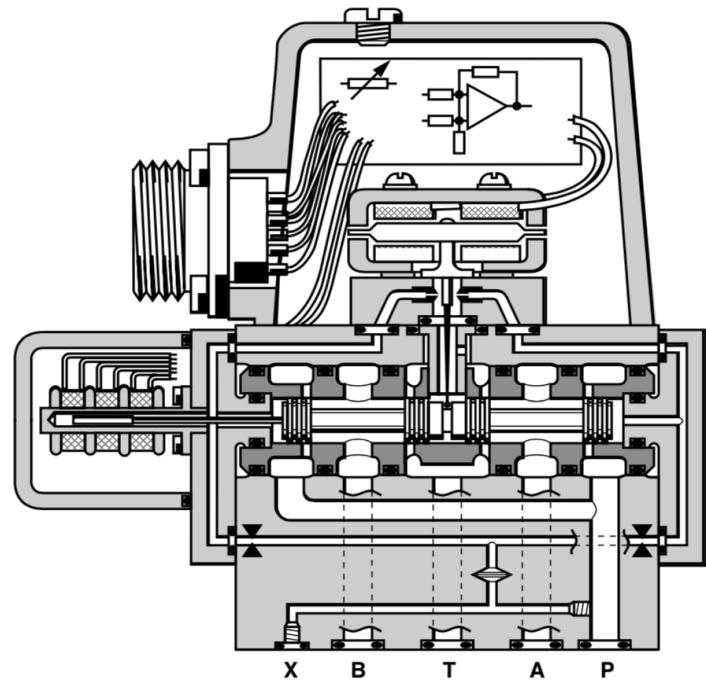


A (+), D (-), B and C connected

Parallel

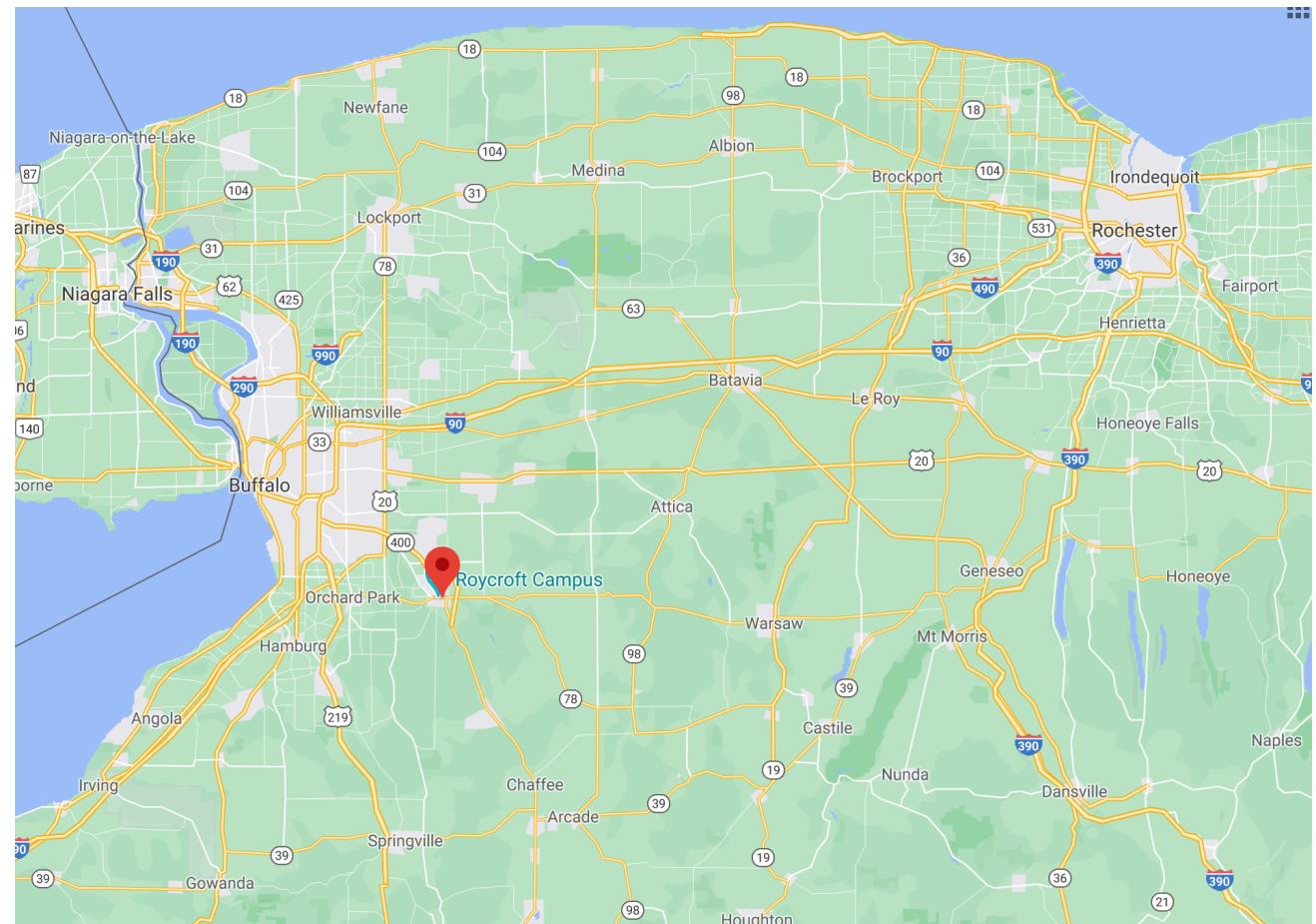


A and C (+), B and D (-)



<https://www.moog.com/literature/ICD/d765seriesvalves.pdf>

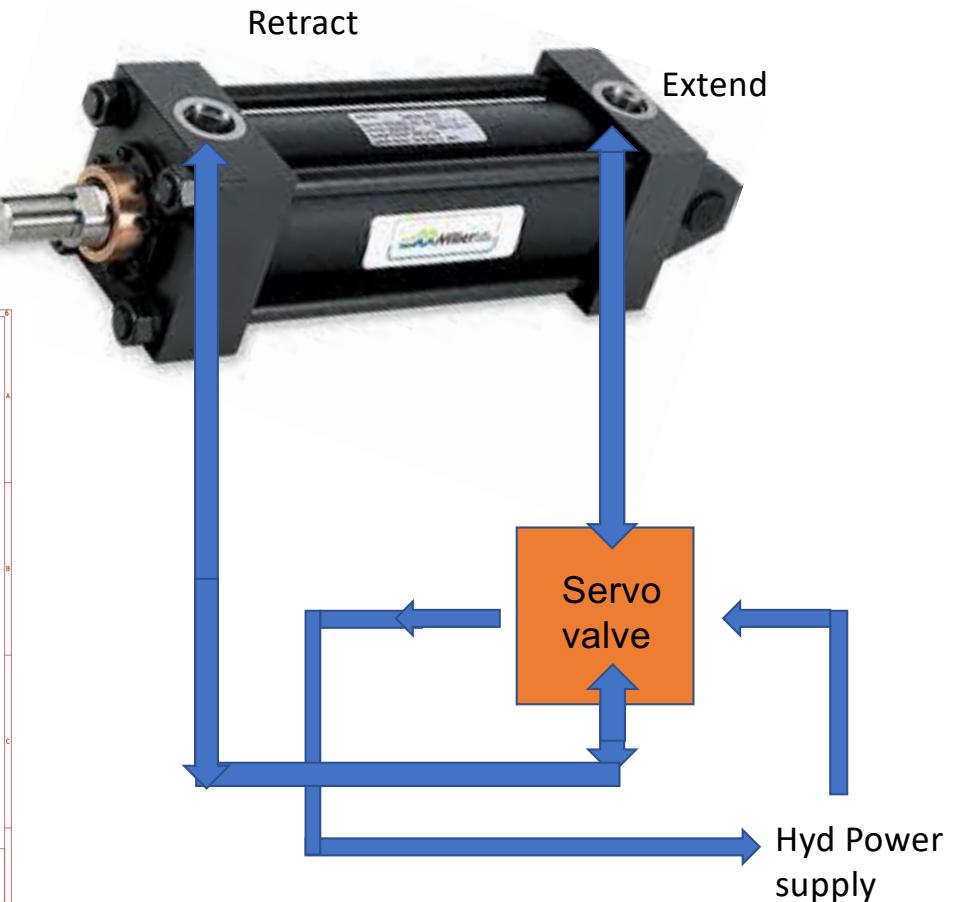
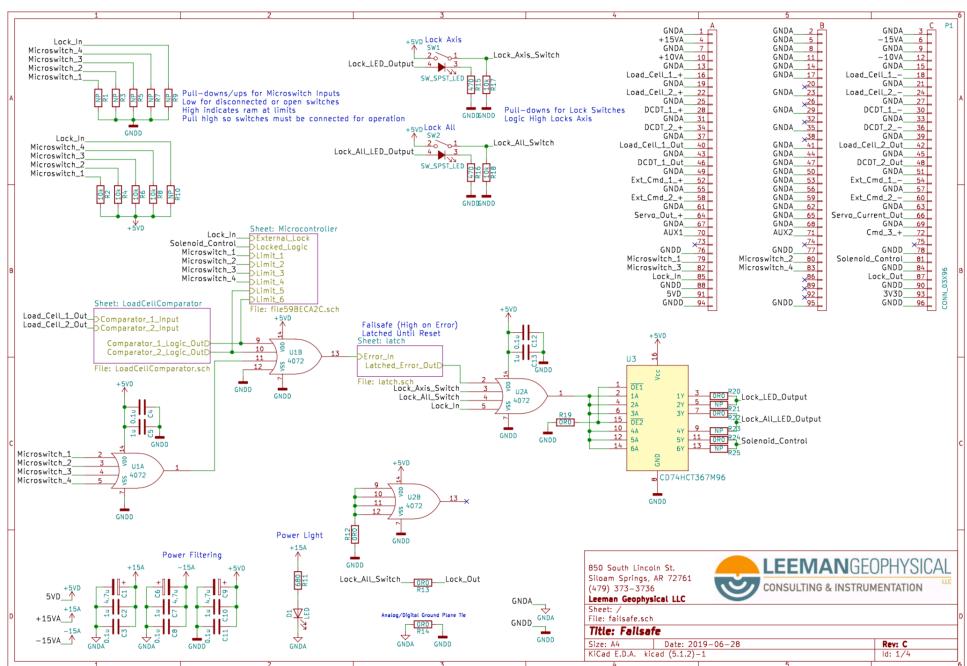
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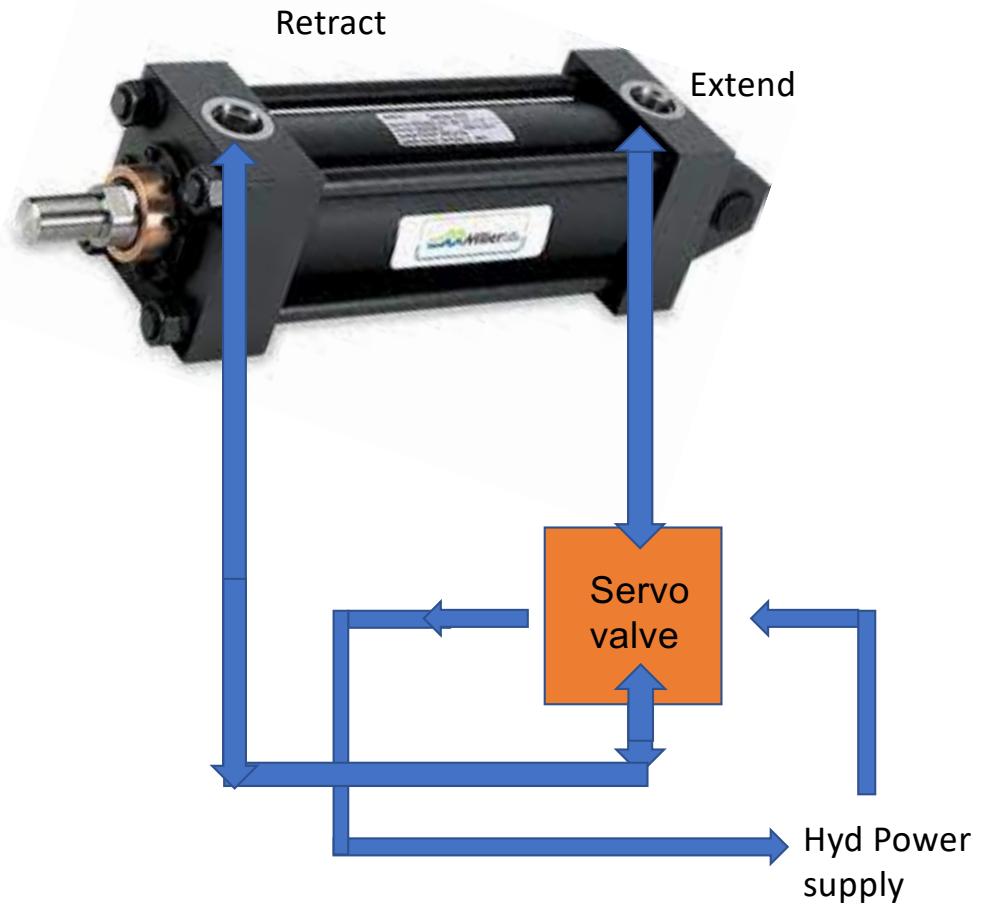
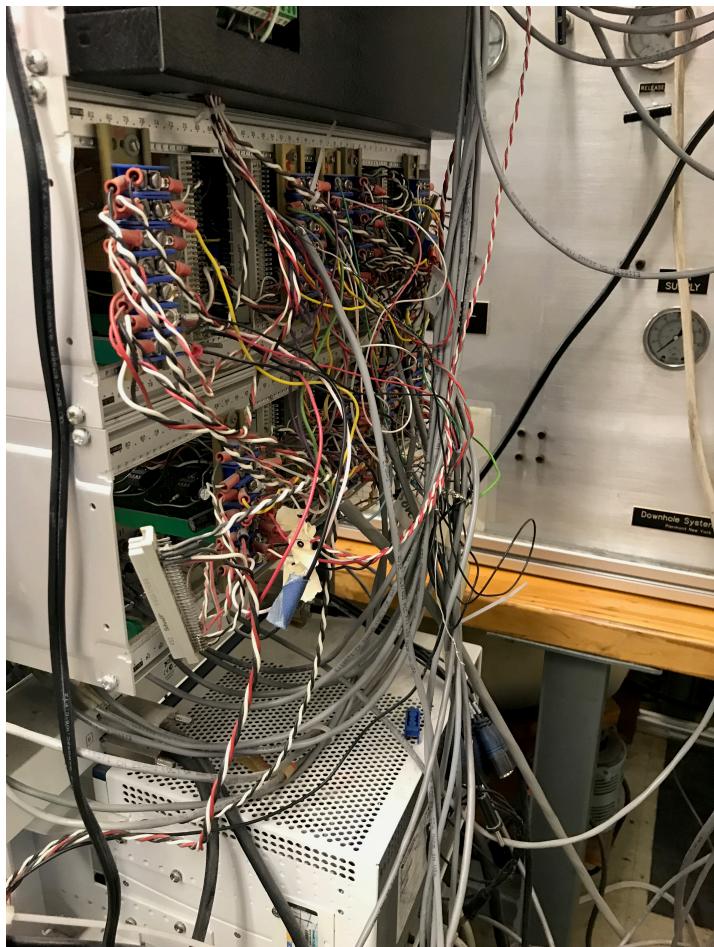
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<https://www.nytimes.com/1997/08/27/business/william-c-moog-jr-82-inventor-of-flight-control-device.html>

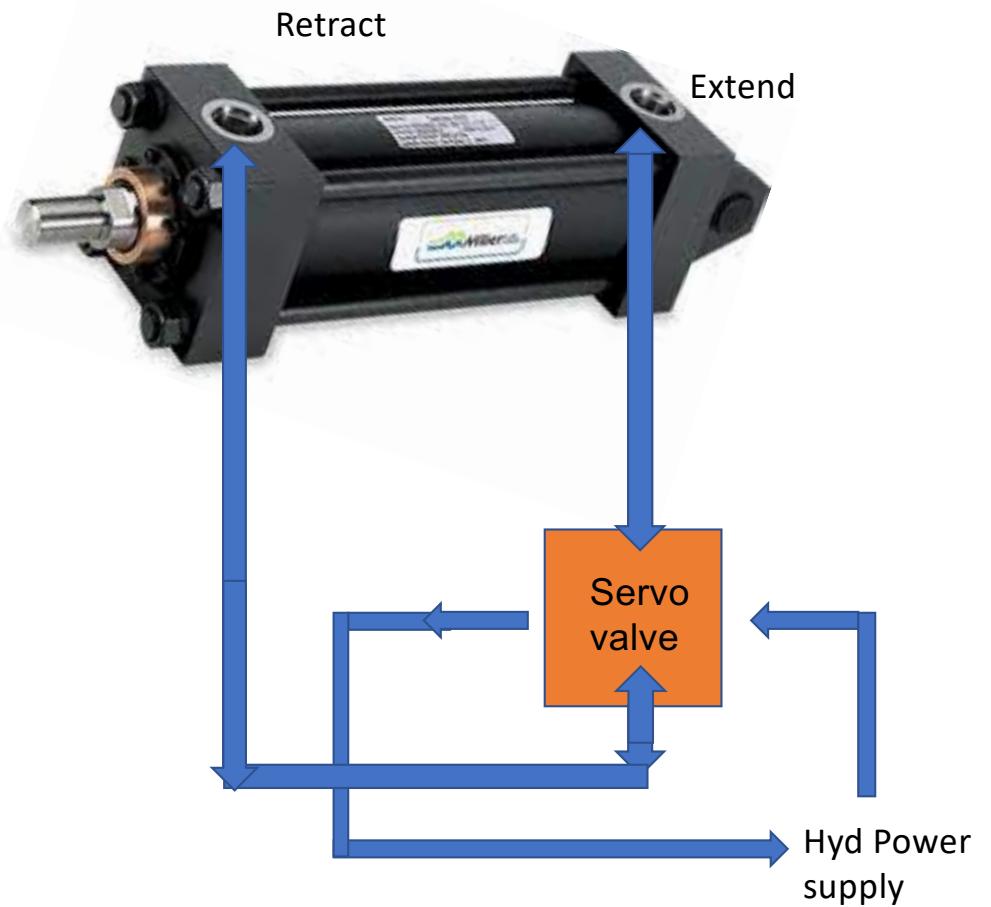
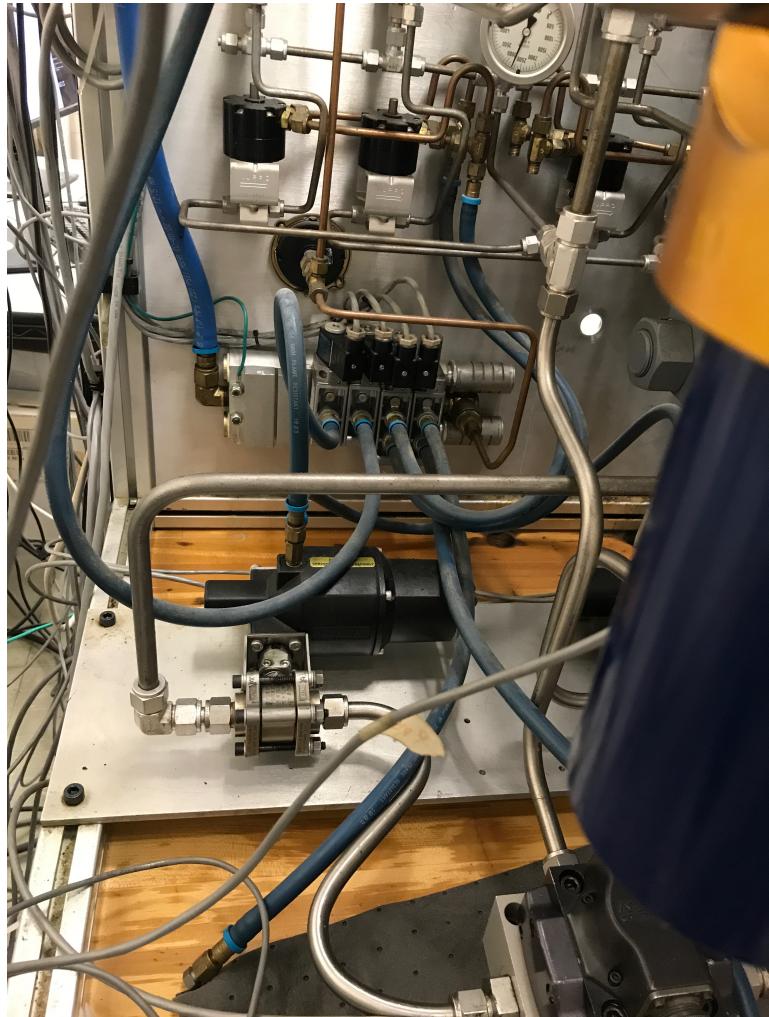
Failsafe



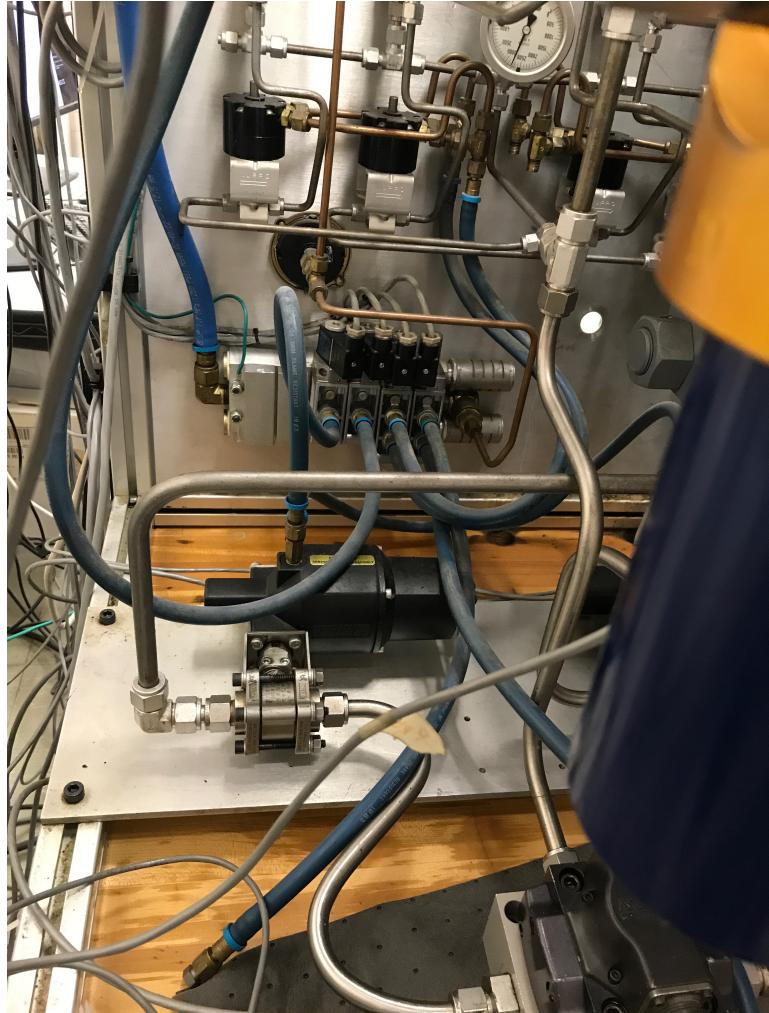
Failsafe



Failsafe



Failsafe



Hard at work....



Field trip....



Acoustics blocks used _____

Temperature (°C): _____

Relative Humidity (%): _____

@ Hyd. Power Supply (HPS)

14. Tank Temp (°C): _____

15. Temp. Out (°C): _____

16. Pres. Out (psi): _____

Chilled water at HPS

1. Temp In (°F): _____

2. Pres. In (psi): _____

3. Temp Out (°F): _____

4. Pres. Out (psi): _____

5. Flow (lpm): _____

Chiller Unit

6. Panel Temp (°F): _____

7. Panel Pres. (psi): _____

8. Near Pres. In (psi): _____

9. Near Pres. Out (psi): _____

Process water at Chiller

10. Temp In (°F): _____

11. Pres. In (psi): _____

12. Temp Out (°F): _____

13. Pres. Out (psi): _____