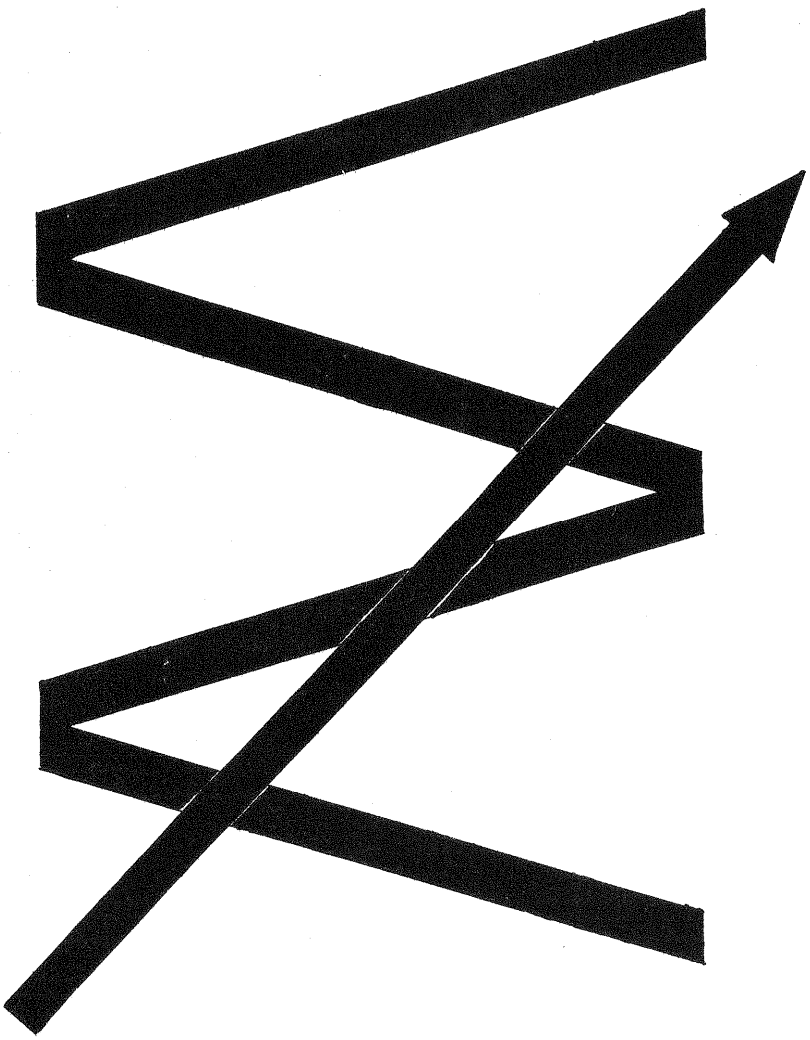
RAYGO WAGNER
PORTLAND, OREGON

FORM #80-216

GRAPHIC SYMBOLS FOR ANSI DRAWINGS



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GRAPHIC SYMBOLS FOR ANSI DRAWINGS

INTRODUCTION:

Fluid Power Systems are those that transmit and control power through use of a pressurized fluid within an enclosed circuit. There are three methods of symbol use; pictorial, cutaway and graphic. Of the three, the graphic symbol is simpler to draw. Component functions and method of operation are obvious. Also of importance, graphic symbols are capable of crossing language barriers and can promote a universal understanding of fluid power systems.

The following illustrations are a partial list of graphic symbols that may be found on RAYGO WAGNER Ansi drawings:

1. Symbol Rules

1.1 ———————————————————

Solid Line: (Main Line Connector).

1.2 — — — — — — — —

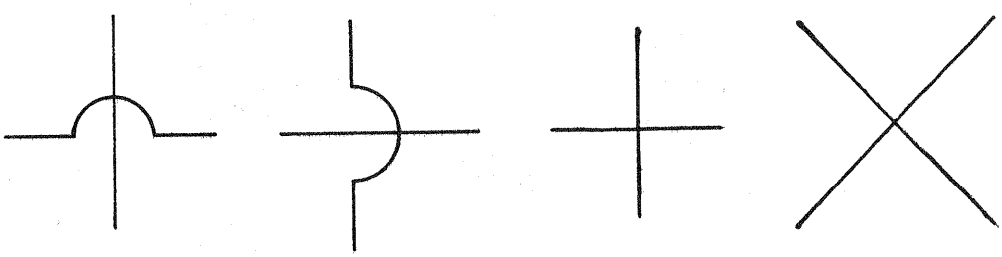
Dash Line: (Pilot Line for Control).

1.3 -

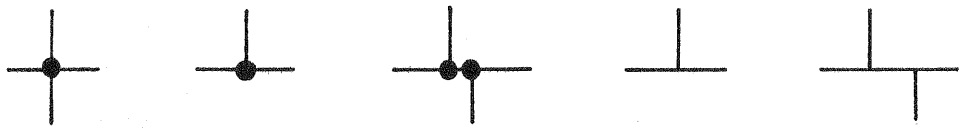
Dotted Line: (Drain Line).

1.4 ——— - ——— - ——— - ——— - ——— - ———

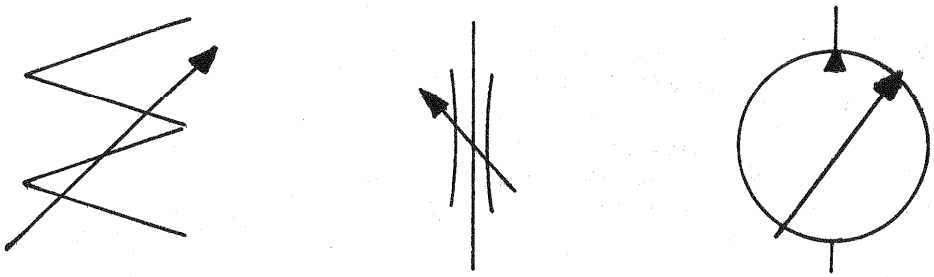
Center Line: (Enclosed Outline).

1.5 

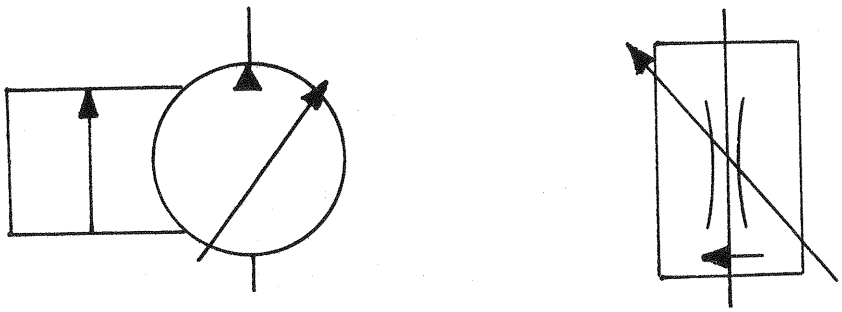
Lines Crossing: (Intersections are not necessarily at a 90° angle).

1.6 

Lines Joined.

1.7 

An arrow through a symbol at approximately 45° indicates that the component can be adjusted or varied.

1.8 

An arrow parallel to the short side of a symbol, within the symbol, indicates that the component is pressure compensated.

2. Fluid Conductor

2.1 

Direction of Flow, Hydraulic.

2.2 

Line with Fixed Restriction.

2.3 

Quick Disconnect: (Connected, Disconnected).

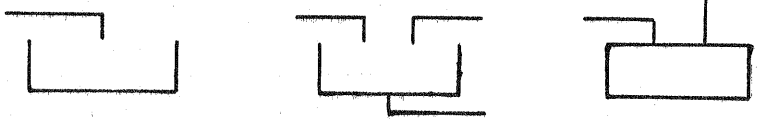
2.4 

Quick Disconnect with two checks:
(Connected, Disconnected).

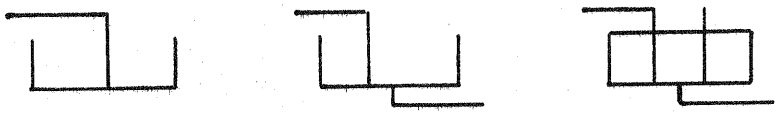
3. Energy and Fluid Storage

3.1 

Reservoir: (Vented, Pressurized).

3.2 

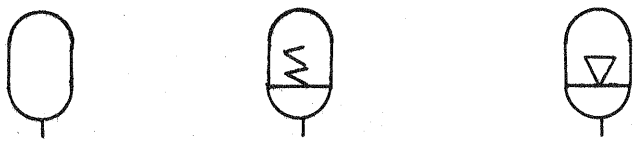
Reservoirs with connecting lines above fluid level.

3.3 

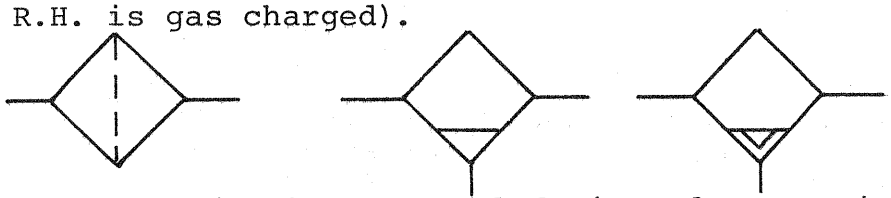
Reservoirs with connecting lines below fluid level.

3.4 

Simplified reservoir symbols of a complete circuit:
(Two L.H., below fluid level, two R.H., above fluid level).

3.5 

Accumulators: (Center Accumulator is spring loaded, R.H. is gas charged).

3.6 

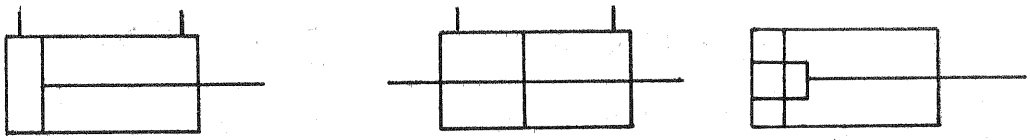
Filters: (Stainer, manual drain and automatic drain).

4. Linear Devices

4.1 

Cylinders, Hydraulic and Pneumatic:
(Single and double acting).

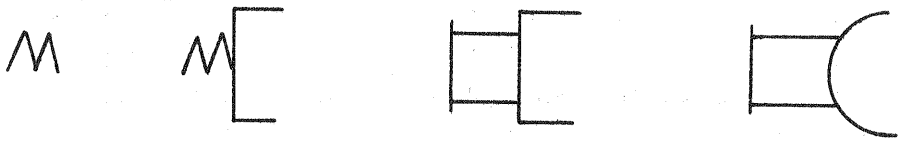
4.2



Cylinders, Hydraulic and Pneumatic:
(Single rod end, double rod end and fixed cushion).

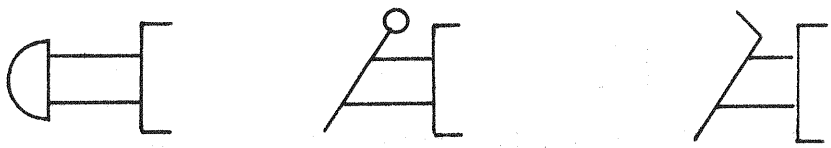
5. Actuators and Controls

5.1



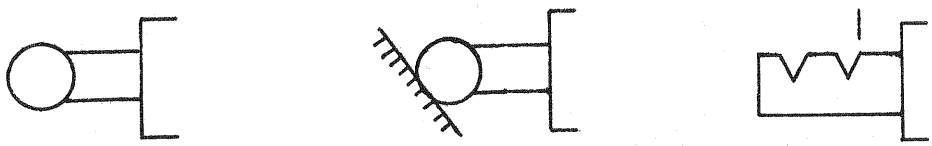
Spring Control Manual Control

5.2



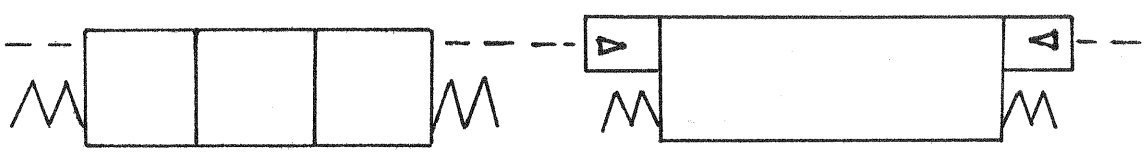
Push Button Lever Pedal or Treadle

5.3



Controls: (Two mechanical at left. Detent at extreme right. A notch is shown for each detent in the actual component).

5.4

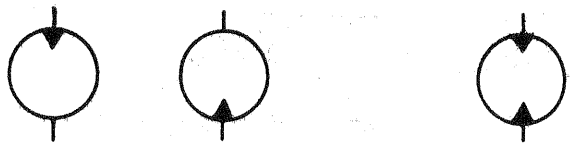


Pilot controlled, spring centered.

6. Rotary Devices

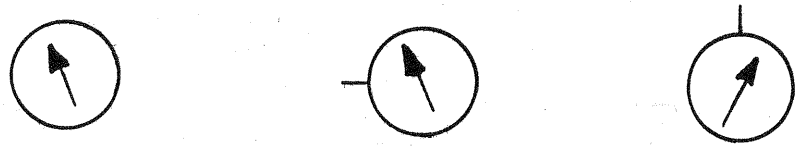
6.1 

Hydraulic Pumps: (Unidirectional and bidirectional).

6.2 

Hydraulic Motors: (Fixed displacement and bidirectional).

7. Instruments

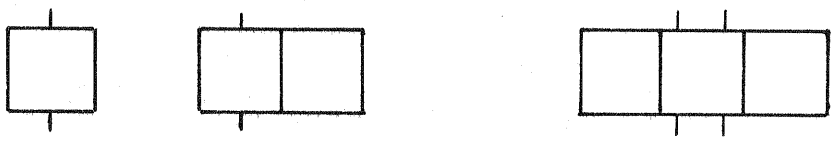
7.1 

Indicating, Recording and Pressure Instruments.

8. Valves

8.1 

Envelopes: (A basic valve symbol is composed of one or more envelopes with lines inside to represent flow paths and flow conditioners between ports).

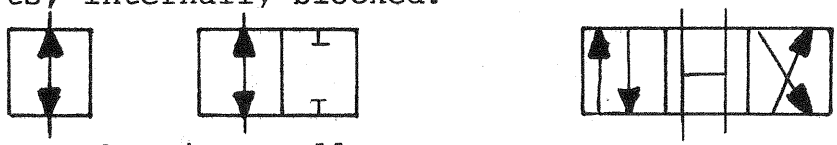
8.2 

Ports: (Symbols do not indicate location of ports, direction of shifting of spool, or position of control elements on actual component).

8.3

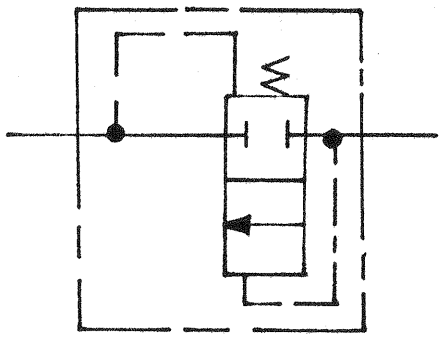
Ports, internally blocked.

8.4



Flow paths, internally open.

8.5



Composite symbol: (Flow to the right is blocked. Flow to the left is permitted).

8.6

Check Valves: (Pilot operated to open and check, pilot operated to close).

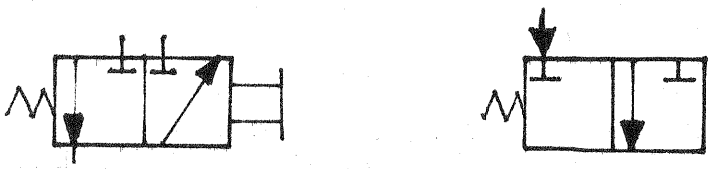
8.7

Two Way Valves: (Normally closed and normally open).

8.8

Infinite Position: (Normally closed and normally open).

8.9



Three Way Valves - Two Position:
(Normally closed and normally open).

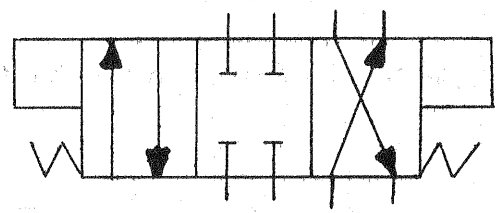
8.10

Four Way Valves - Two Position: (Normal).

8.11

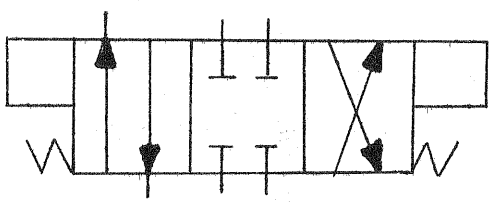
Four Way Valves - Two Position: (Actuated).

8.12



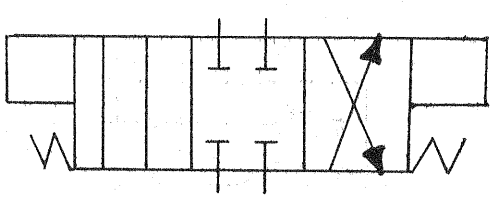
Three Position: (Normal).

8.13



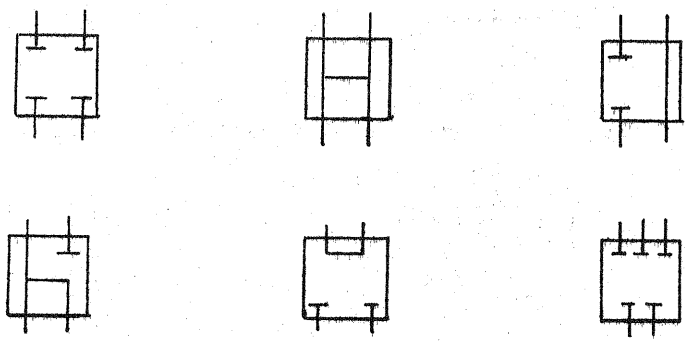
Three Position: (Actuated Left).

8.14



Three Position: (Actuated Right).

8.15



Typical flow paths for center condition of three position valves.

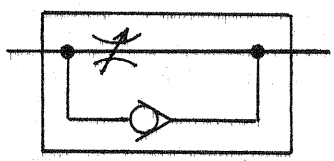
8.16

Pressure Relief: (Normal and actuated or relieving).

8.17

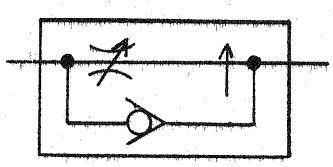
Adjustable, Non-Compensated: (Flow control in each direction).

8.18



Adjustable with Bypass: (Flow is controlled to the right. Flow to the left bypasses control).

8.19



Adjustable and pressure compensated with bypass.

9. Representative Composite Enclosures

9.1

Component enclosure may surround a complete symbol or a group of symbols to represent an assembly. It is used to convey more information about component connections and functions. Enclosure indicates extremity of component or assembly. External ports are assumed to be on enclosure line and indicate connections to component.

Flow lines cross enclosure line without loops or dots.

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