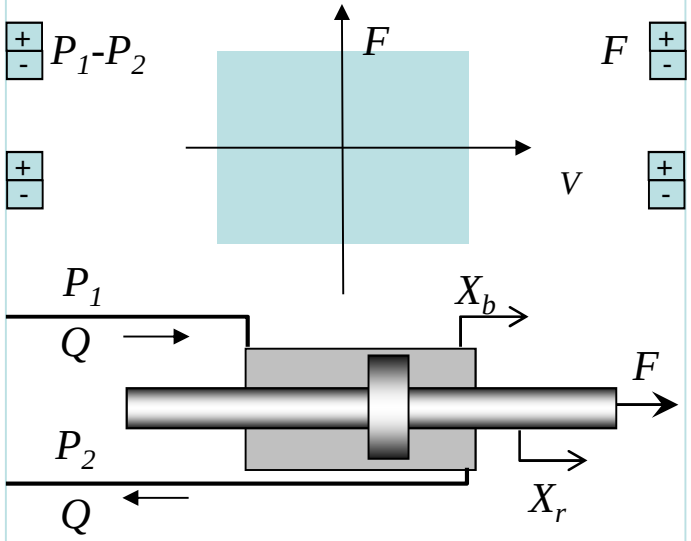
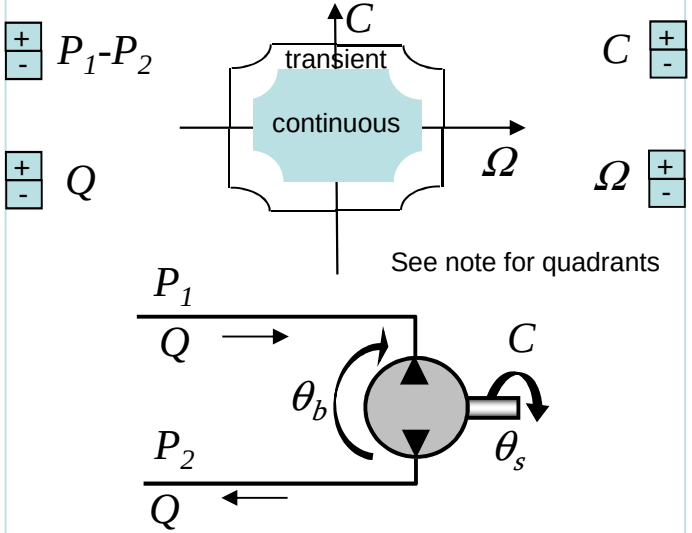
Linear Symmetrical Jack



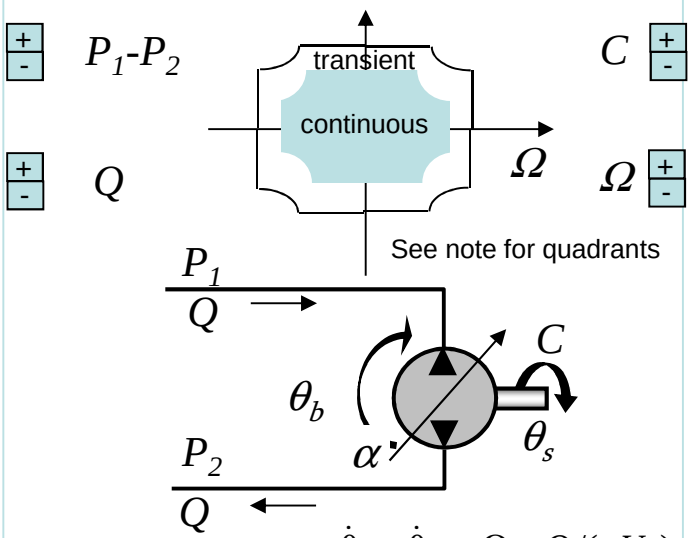
$F = S(P_1 - P_2)$ $\quad \dot{X}_r - \dot{X}_b = V = Q/S$

Fixed displacement motor



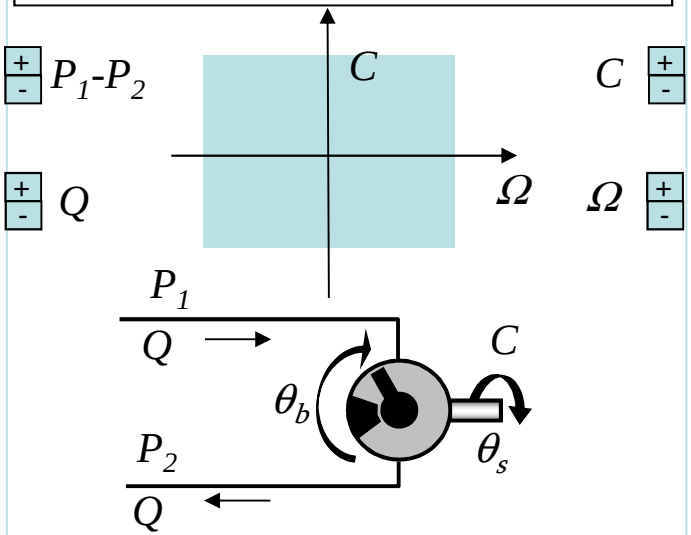
$C = V_0(P_1 - P_2)$ $\quad \dot{\theta}_r - \dot{\theta}_b = \Omega = Q/V_0$

Variable displacement motor



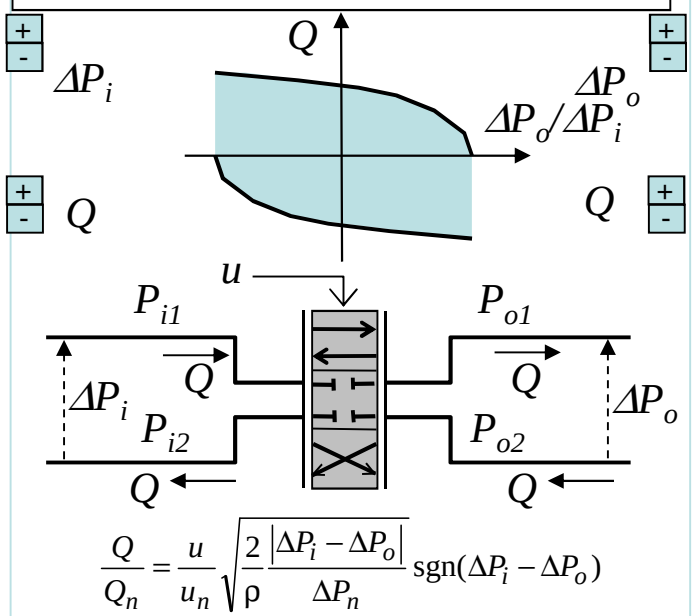
$C = \alpha V_0(P_1 - P_2)$ $\quad \dot{\theta}_r - \dot{\theta}_b = \Omega = Q/(\alpha V_0)$

Rotary jack



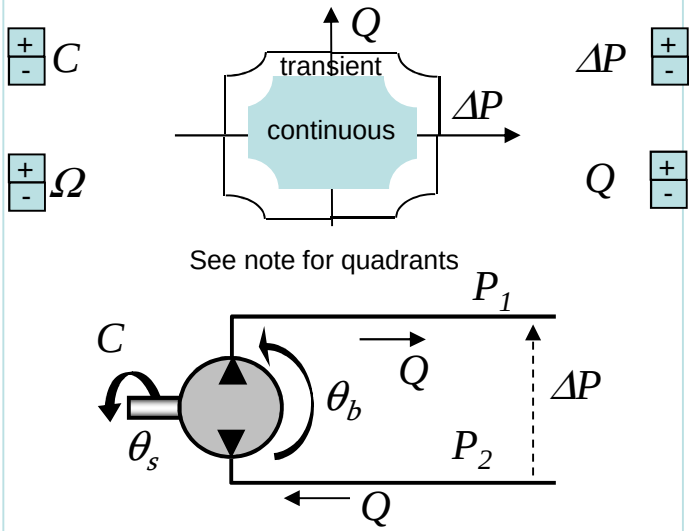
$C = V_0(P_1 - P_2)$ $\quad \dot{\theta}_r - \dot{\theta}_b = \Omega = Q/V_0$

Distributor



$$\frac{Q}{Q_n} = \frac{u}{u_n}\sqrt{\frac{2}{\rho}\frac{|\Delta P_i - \Delta P_o|}{\Delta P_n}}\,\mathrm{sgn}(\Delta P_i - \Delta P_o)$$

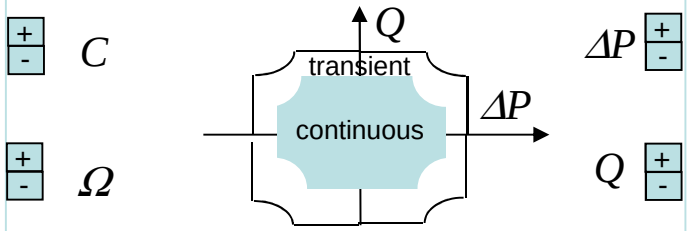
Fixed displacement pump

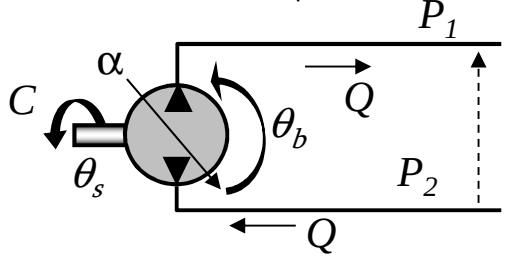


$\Delta P = C/V_0$ $\quad Q = V_0(\dot{\theta}_r - \dot{\theta}_b) = V_0\Omega$

H7 H7 H9 H9 H11 H11

Variable displacement pump

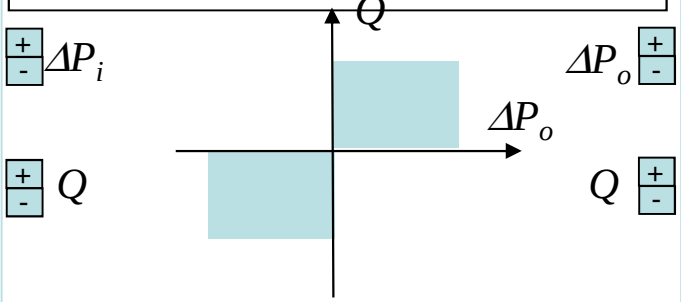


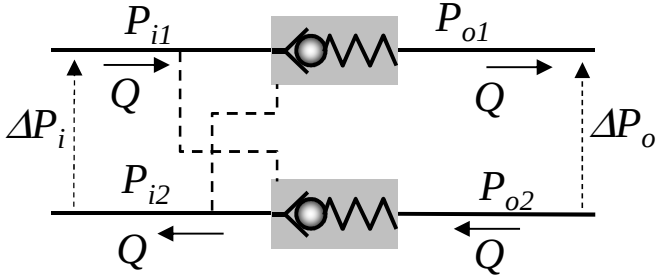


$\Delta P = C/(\alpha V_0)$ $Q = \alpha V_0(\dot{\theta}_r - \dot{\theta}_b) = \alpha V_0 \Omega$

H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

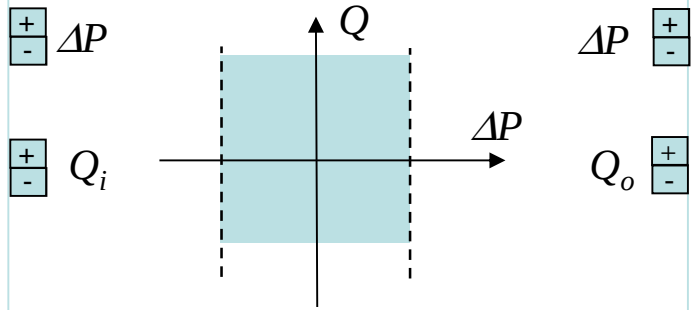
Piloted check valve

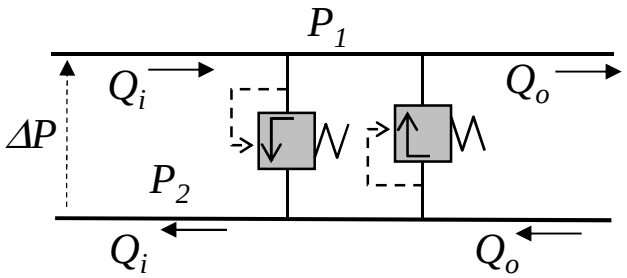




H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

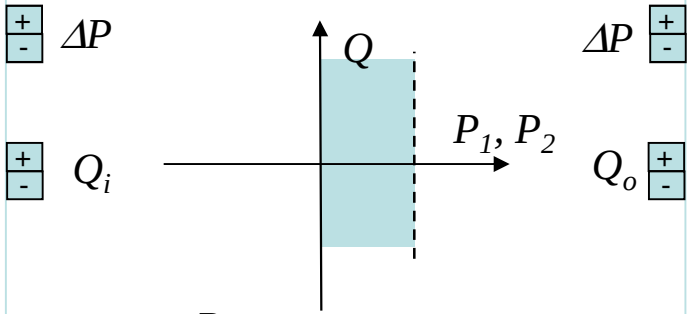
Differential pressure relief

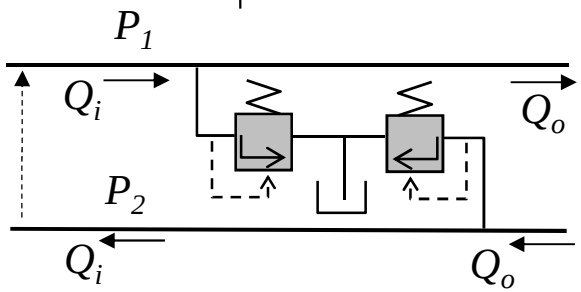




H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

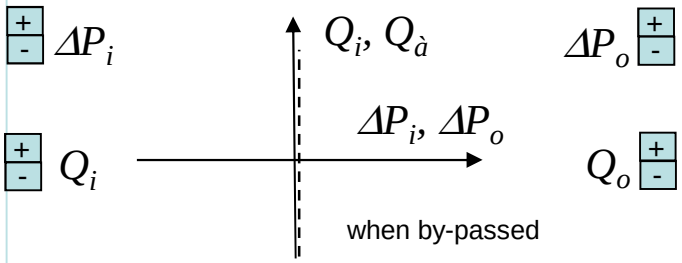
Pressure relief

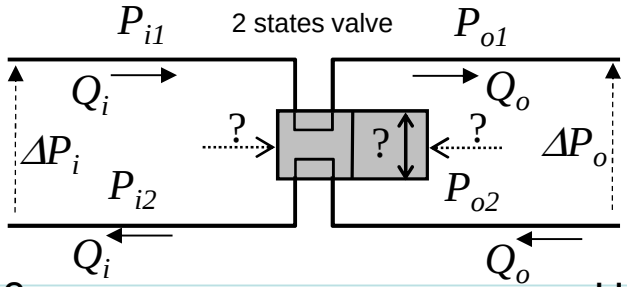




H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

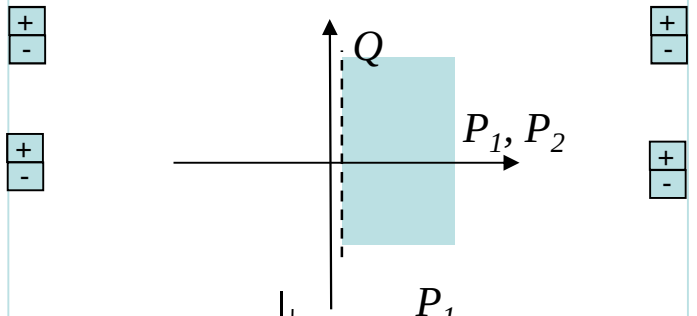
Bypass/Insulation valve

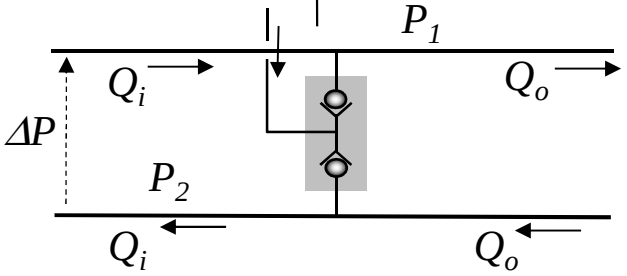




H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

Re-feeding





H7 H8 H7 H8 H9 H10 H9 H10 H11 H12 H11 H12

Variable displacement motor

Functions

• To transform hydraulic power into mechanical power (rotation) with variable ratio
• Reversibility depending on design

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

Fixed displacement motor

Functions

• To transform hydraulic power into mechanical power (rotation)
• To transform mechanical power (rotation) into hydraulic power if reversible (depending on design)

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

Linear Symmetrical Jack

Functions

• To transform hydraulic power into mechanical power (translation)
• To transform mechanical power (translation) into hydraulic power

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

Fixed displacement pump

Functions

• To transform mechanical power (rotation) into hydraulic power
• May be reversible (depending on design)

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

4 ways, critical centre valve

Functions

• To meter hydraulic power through variable orifices controlled by valve opening (called flow control valve)

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

Rotary jack

Functions

• To transform hydraulic power into mechanical power (rotation) with limited stroke
• To transform mechanical power (translation) with limited stroke into hydraulic power

Operational limits

- Transient (rapid degradation):
- Continuous (gradual degradation):

Model

- Perfect (main function):
- Main imperfections:

H11 H11

Differential pressure relief

Functions
• To limit pressure difference to a maximal value
• Blow-off pressure can be adjustable by external mean (mech, elec, hydr)

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H11 H11 H12 H12

H9 H9

Piloted check valve

Functions
• To ensure irreversibility (power flowing from right side to left side)

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H9 H9 H10 H10

H7 H7

Variable displacement pump

Functions
• To transform mechanical power (rotation) into hydraulic power into with variable ratio
• May be reversible depending on design

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H7 H7 H8 H8

Re-feeding

Functions
• To avoid cavitation by limiting individual lower pressure

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H12 H12

Bypass/Insulation valve

Functions
• Insulate left and right parts while bypassing right side (left side way either bypassed of closed given design needs)
• Insulated area may be used to create hydraulic damping

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H10 H10

Pressure relief

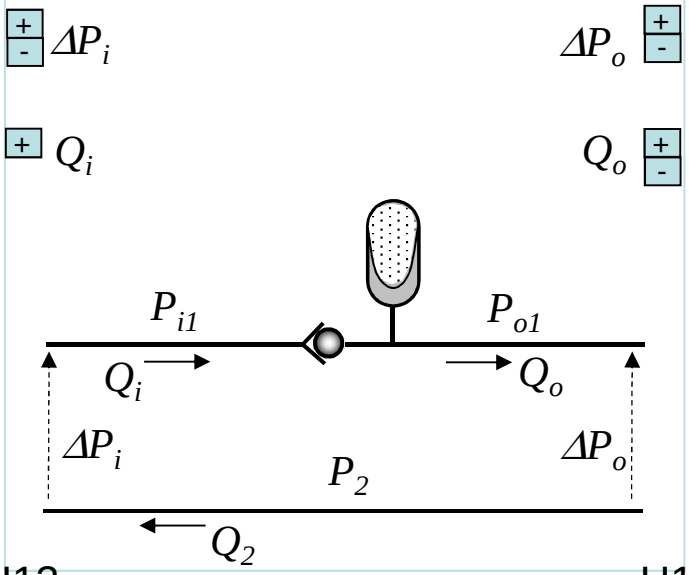
Functions
• To avoid individual overpressure
• Cracking pressure can be adjustable by external mean (mech, elec, hydr)

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

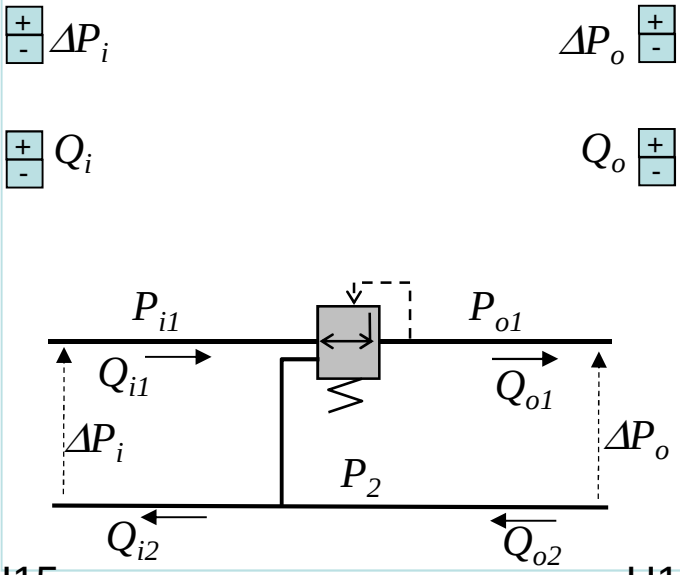
Model
- Perfect (main function):
- Main imperfections:

H8 H8

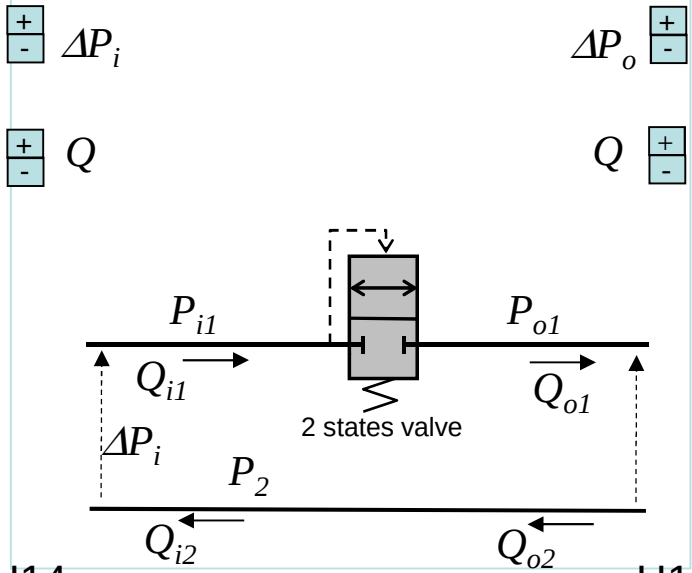
Supply accumulator



Pressure restrictor



Priority valve



H15 H15 H13 H13

Pressure restrictor

Functions
• To reduce pressure

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

Supply accumulator

Functions
• To store/ provide energy during transient without back flow to upstream circuit

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H15 H15 H13 H13

H14 H14

Priority valve

Functions
• To stop supplying downstream circuit in case of insufficient pressure

Operational limits
- Transient (rapid degradation):
- Continuous (gradual degradation):

Model
- Perfect (main function):
- Main imperfections:

H14 H14