

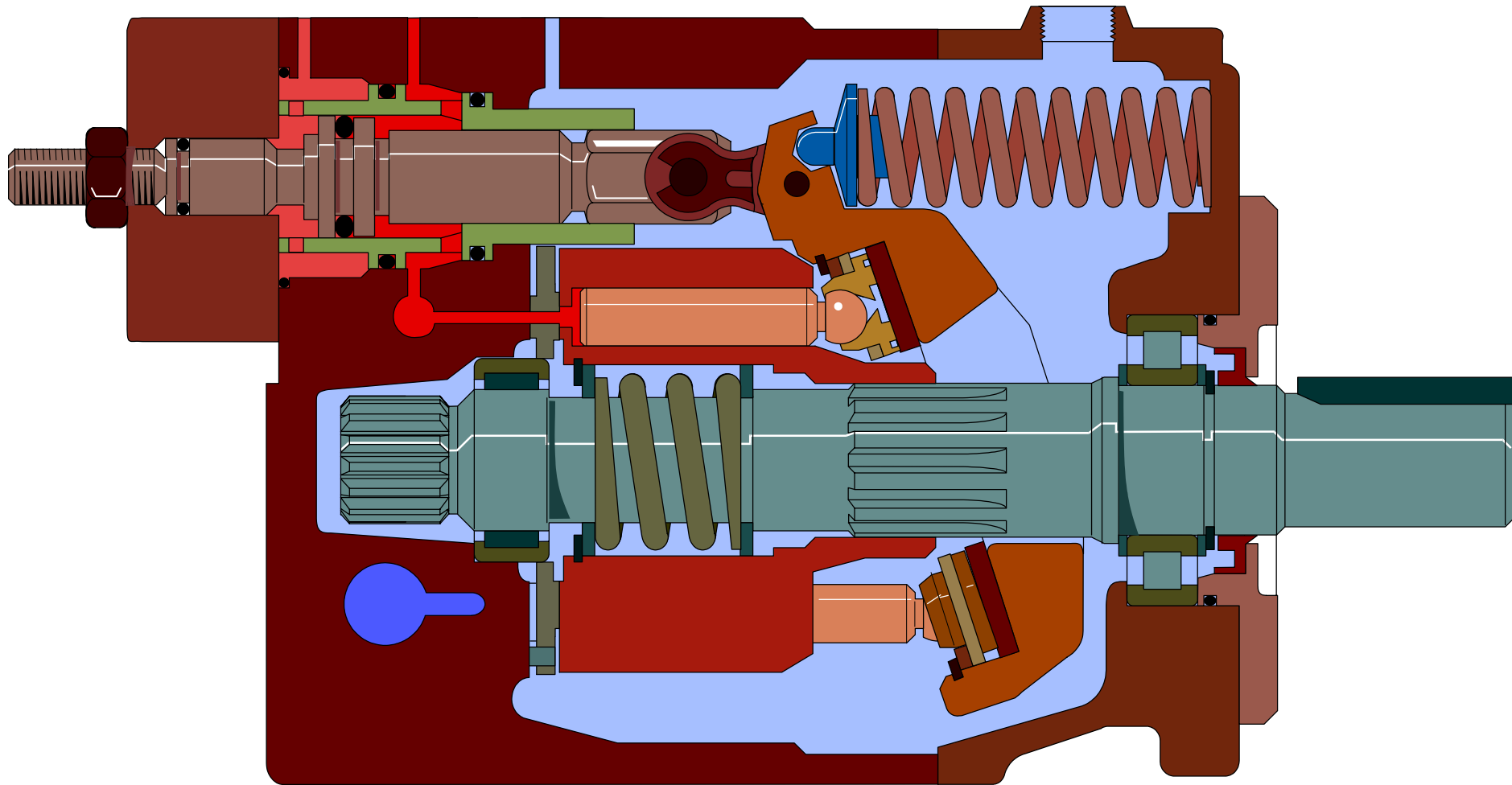
PV Series

Heavy Duty Industrial Piston Pumps



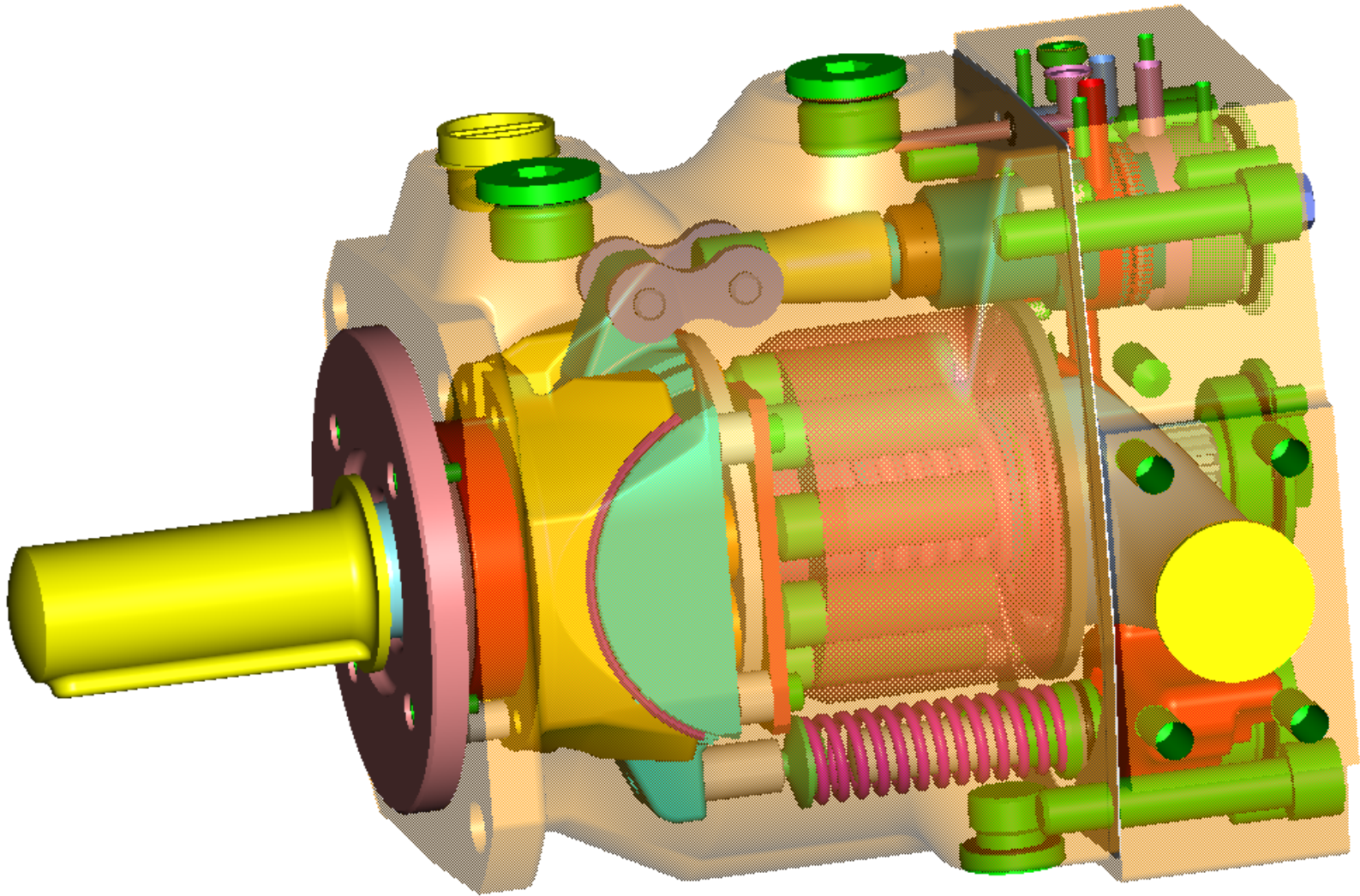
- **12 Displacements, cc/rev**
 - 16, 20, 23, 32, 40, 46, 63, 80, 92, 140, 180, 270
- **Pressure Ratings**
 - 5000 psi Continuous, 6000 psi Intermittent
- **Controls**
 - Pressure Compensated
 - Remote Compensated
 - Load Sense
 - Horsepower Control
- **Features & Benefits**
 - **Ripple Chamber Technology**
 - **Lowest Pump Noise in Industry**
 - **100% Thru Shaft Capability**

Old Design PV series

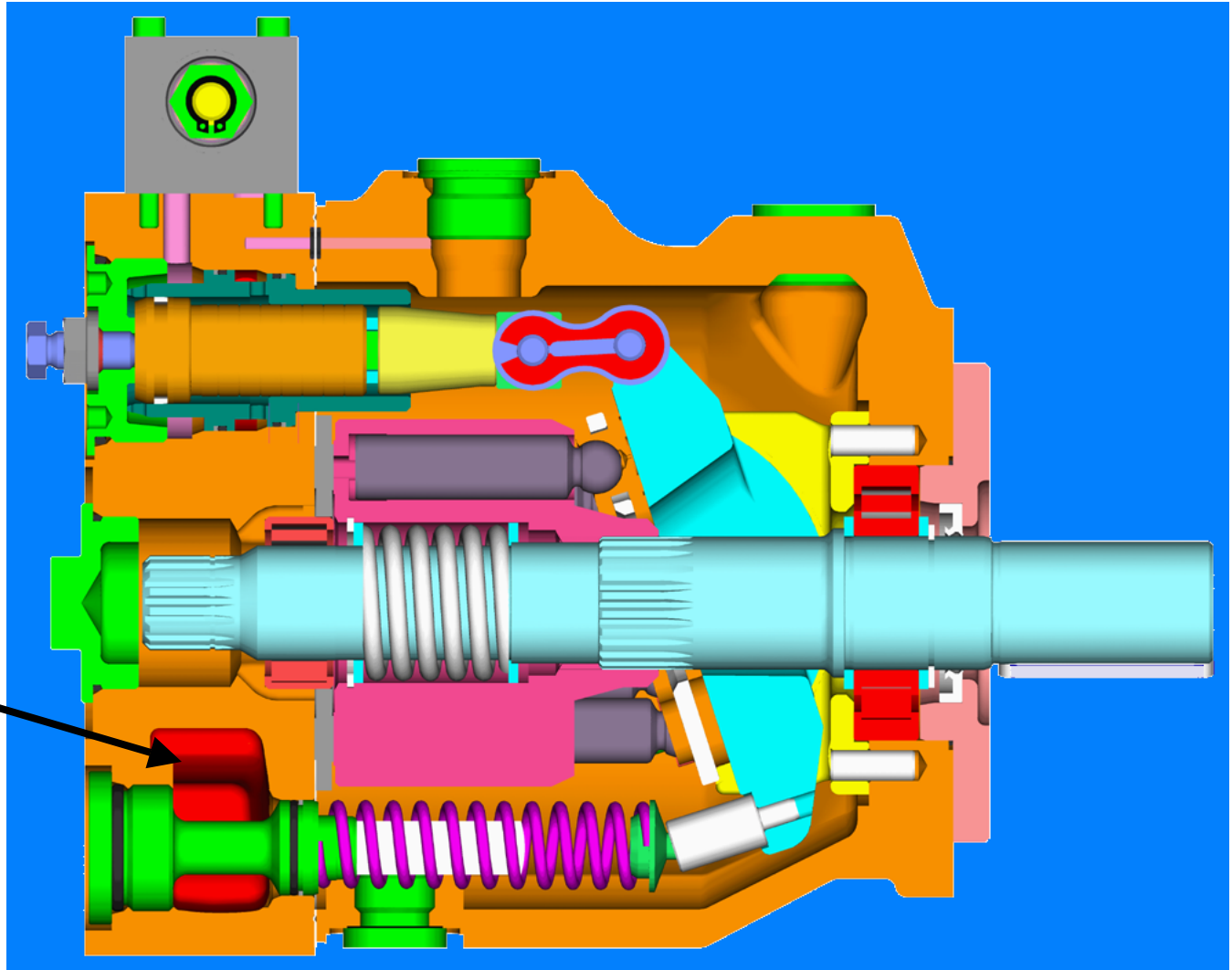


- **reduced noise level**
- **higher efficiency**
- **improved robustness**
- **improved speed limits**
- **weight reduction, esp. for PV250**
- **in house production of PV130, PV180 and PV250**
- **keep all critical parts unchanged**
- **full interchangeability with existing PV series**

Design Result, Transparent



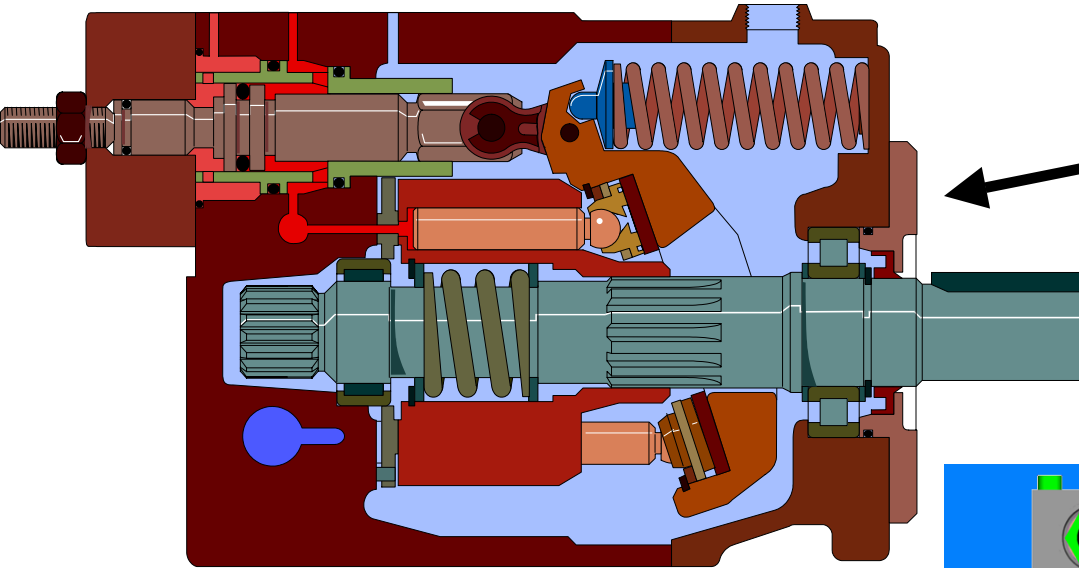
Pre-compression
Volume
(Ripple Chamber)



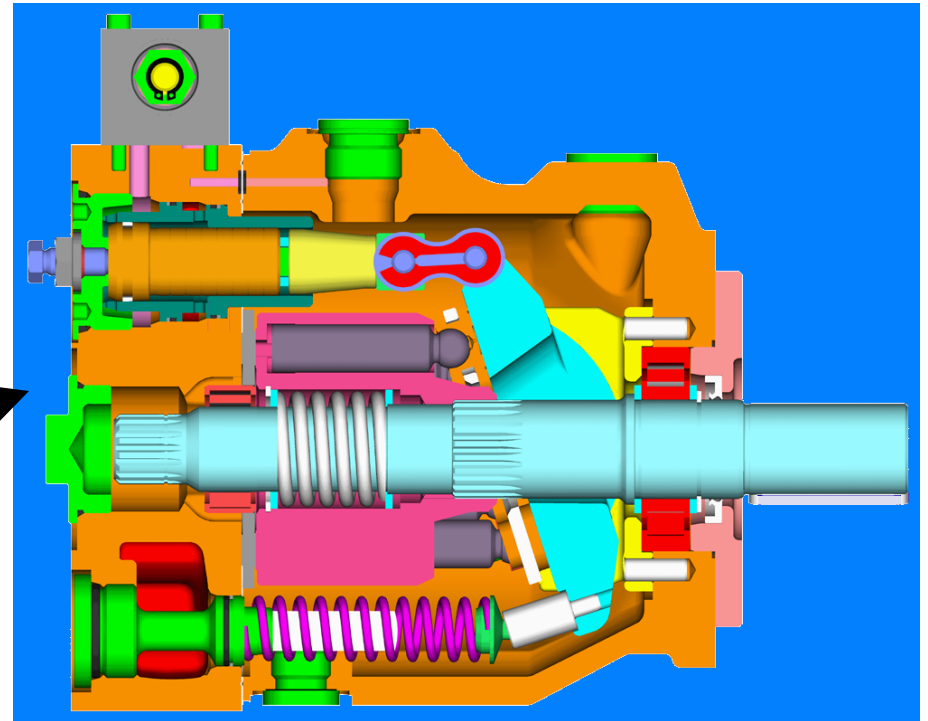
Comparison Old PV to PVplus

Parker

Old PV Design



PV plus Design



- **Reduced Noise through:**
 - **Lower frequency gives better “sound”**
 - **Flow pulsation reduction more than 50%**
 - **Average reduction in typical application: 3 dBA**
- **More mounting options**
- **More thru shaft options**
- **Higher speed limits (10 - 15%)**
- **More flow: PV130 → PV140; PV250 → PV270**
- **Less weight (e. g.: PV270: 230 → 170 kg)**
- **Higher efficiency through fixed clearance slipper retainer**

- **all frame sizes completed acceptance test without problems**
 - **1,000 h @ full pressure, full flow**
 - **3,000,000 cycles (0.5 - 1 per second)**
 - **50 bar 100%**
 - **300 bar 100%**
 - **50 bar 100%**
 - **350 bar deadhead**

- **Speed limits (self priming speed):**

- **PV023** **3,000 rpm**
- **PV046** **2,800 rpm**
- **PV063** **2,800 rpm**
- **PV080** **2,500 rpm**
- **PV092** **2,300 rpm**
- **PV180** **2,200 rpm**
- **PV140** **2,600 rpm at 140 cm³/rev**
 - > 3,000 rpm at 100 cm³/rev**
- **PV270** **1,800 rpm at 270 cm³/rev**
 - 1,950 rpm at 250 cm³/rev**

- Fluid Borne Noise

- Conventional piston pumps produce a flow ripple that travels through all downstream components.



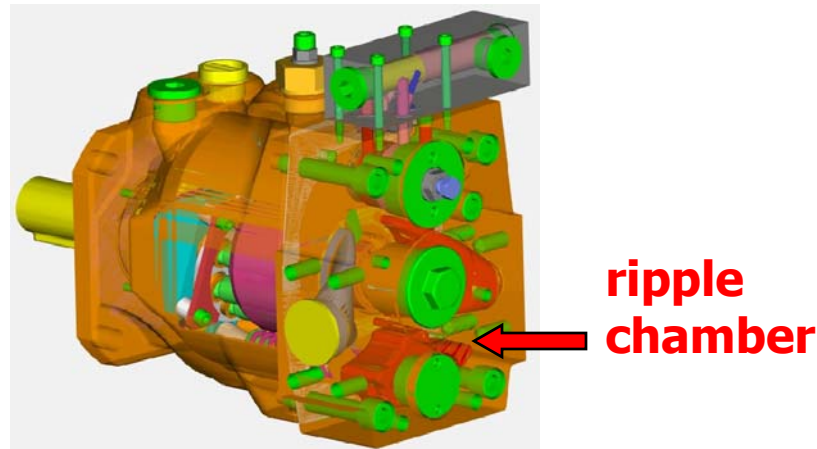
**Valves
Manifolds
Filters
Hoses**

- This flow ripple is due to the loss of flow when the piston changes from low pressure to system pressure.

New piston pump technology-

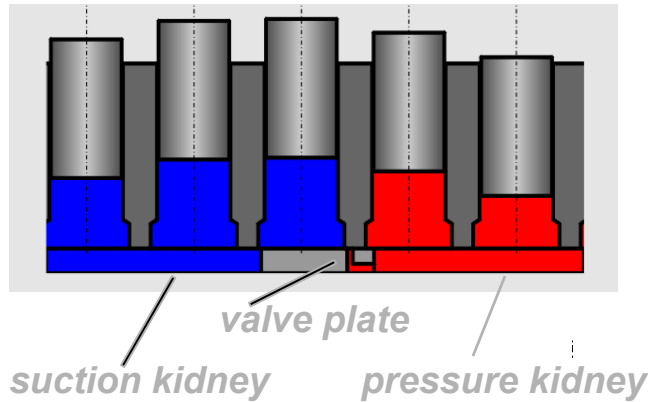
Pre-compression chambers in piston pumps

To reduce fluid borne noise, a pre-compression chamber (ripple chamber) is designed into the pump to reduce the output flow pulsation.

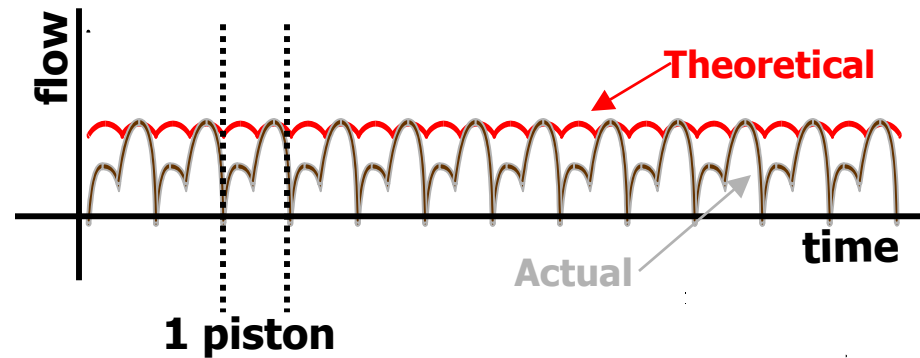


Traditional Design - Shown Pictorially

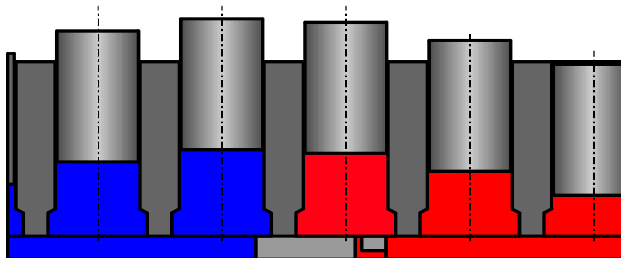
1° rotation



→ Output flow is used to pre-fill the outlet piston

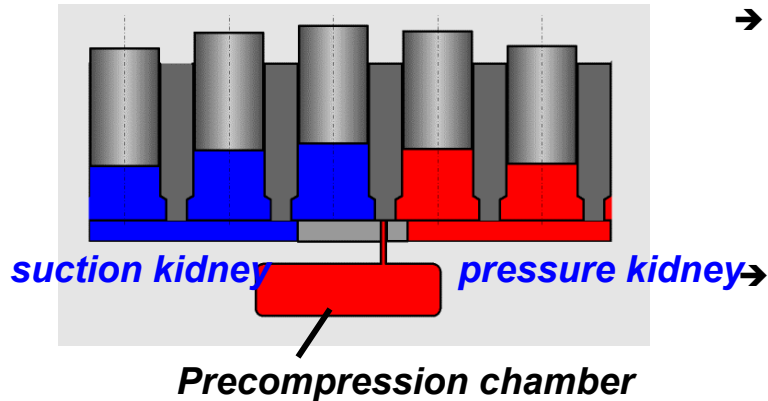


12° rotation



→ This causes a loss of flow and the resulting ripple

1° rotation



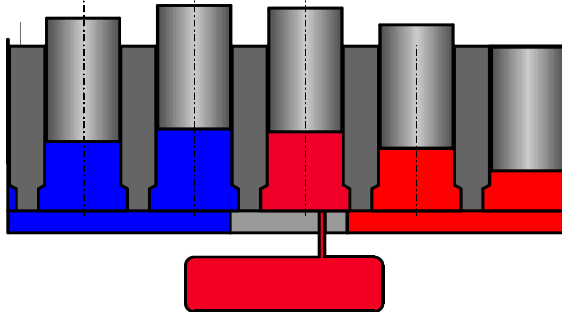
→ The precompression chamber is located in the rear cover of the pump and holds a volume of oil that is pressurized to the system pressure

→ The advantage of the ripple chamber is a smooth pressure transient in the piston from low to high pressure.

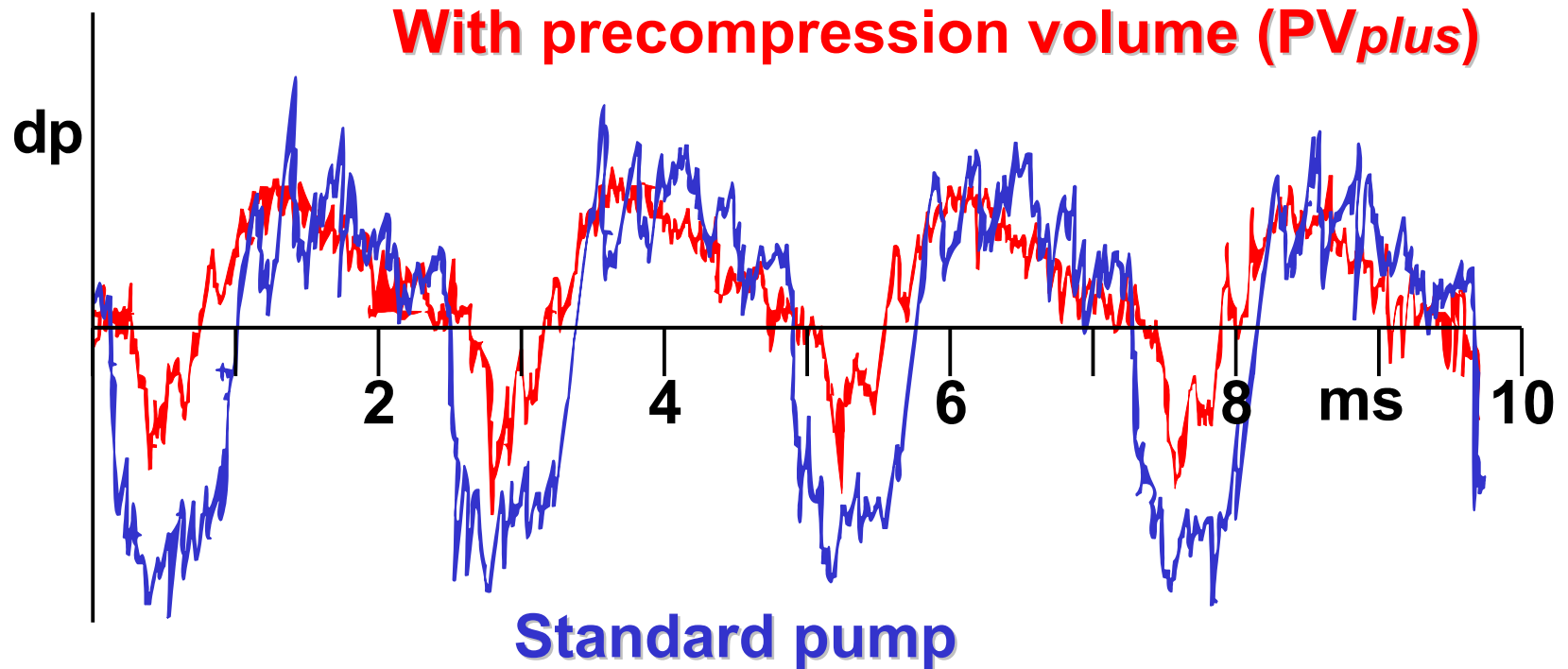
→ This volume of oil precharges the piston and then is refilled when the piston is connected to the pressure kidney

→ The refill of the precompression chamber also takes a longer period of time resulting in a lower effect on the loss of output flow

12° rotation



The result = reduced flow pulsation and a quieter hydraulic system!



Standard pump pulsation has higher amplitude and more high frequent content

PV Controls



Standard pressure compensator, code **F*S**, ordering code

PV046R1K1S1NF * S

S = screw and lock
nut adjustment

standard pressure
compensator:

D = 25 - 140 bar

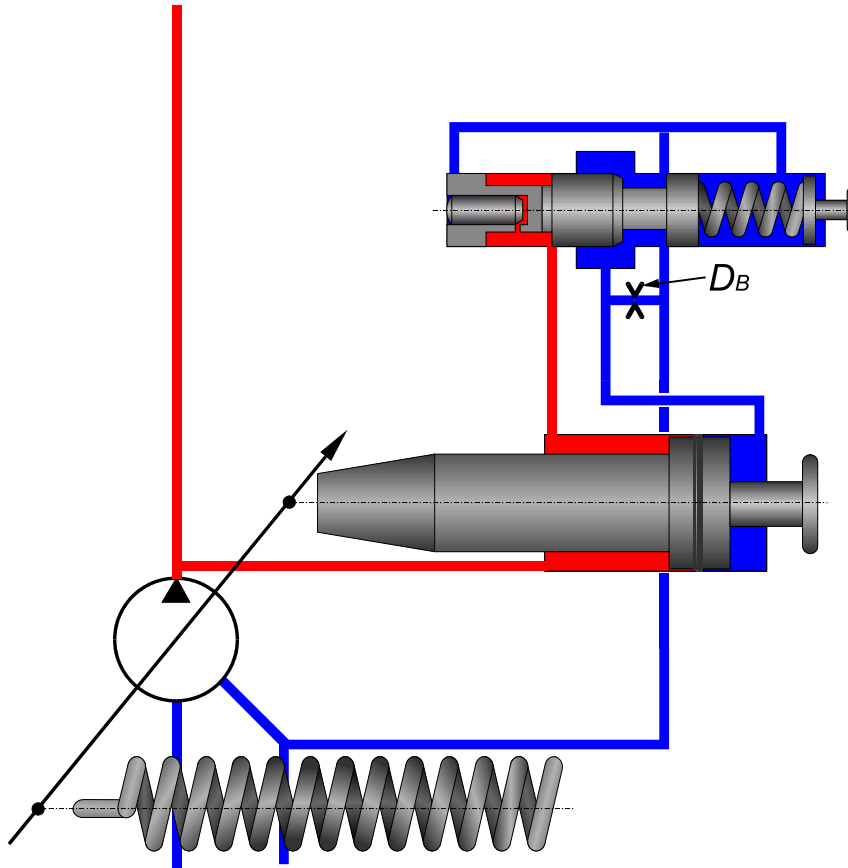
H = 40 - 210 bar

W = 70 - 350 bar

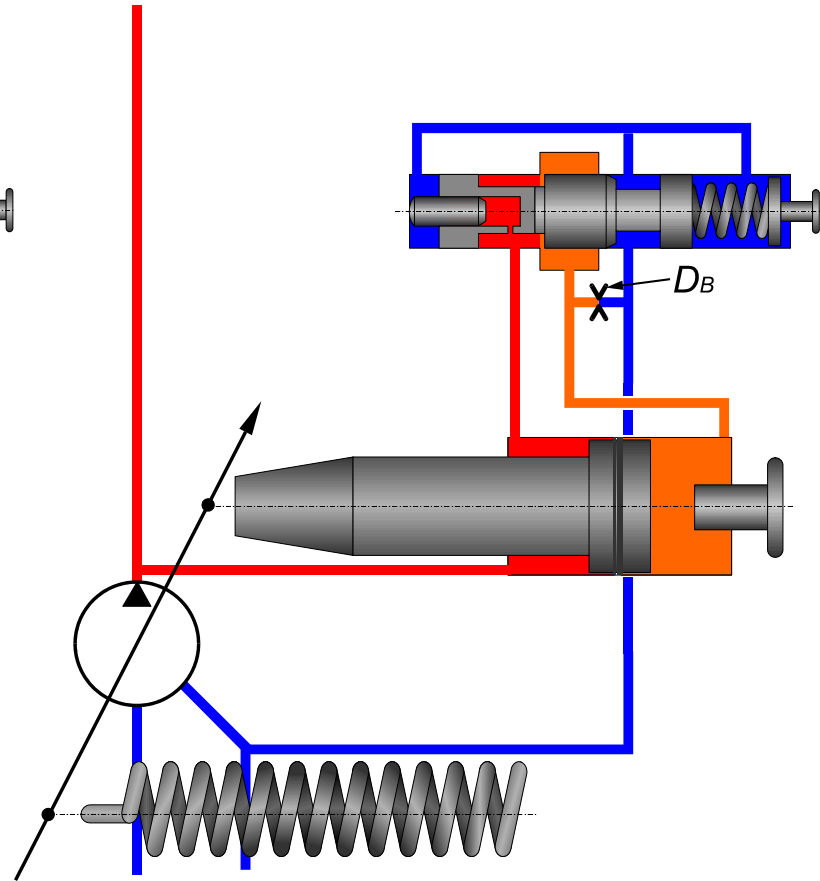
F = fast response

Standard pressure compensator F*S

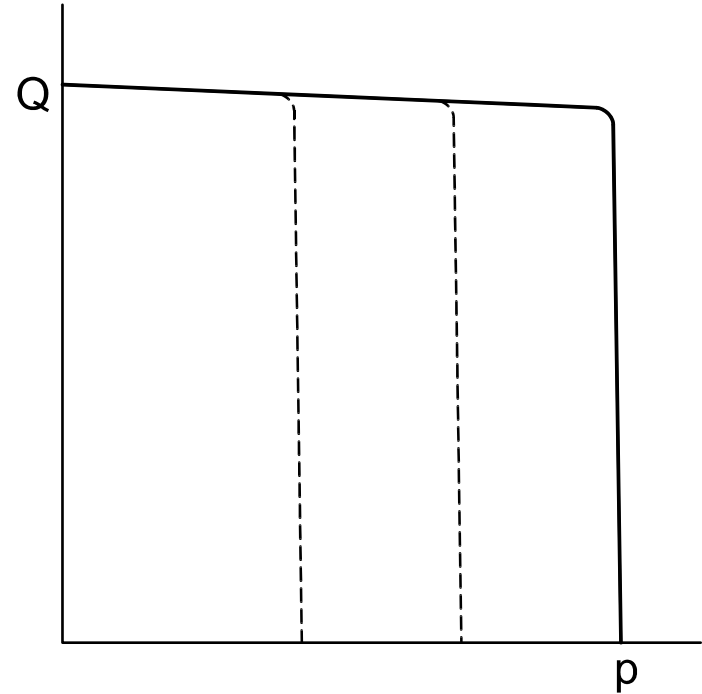
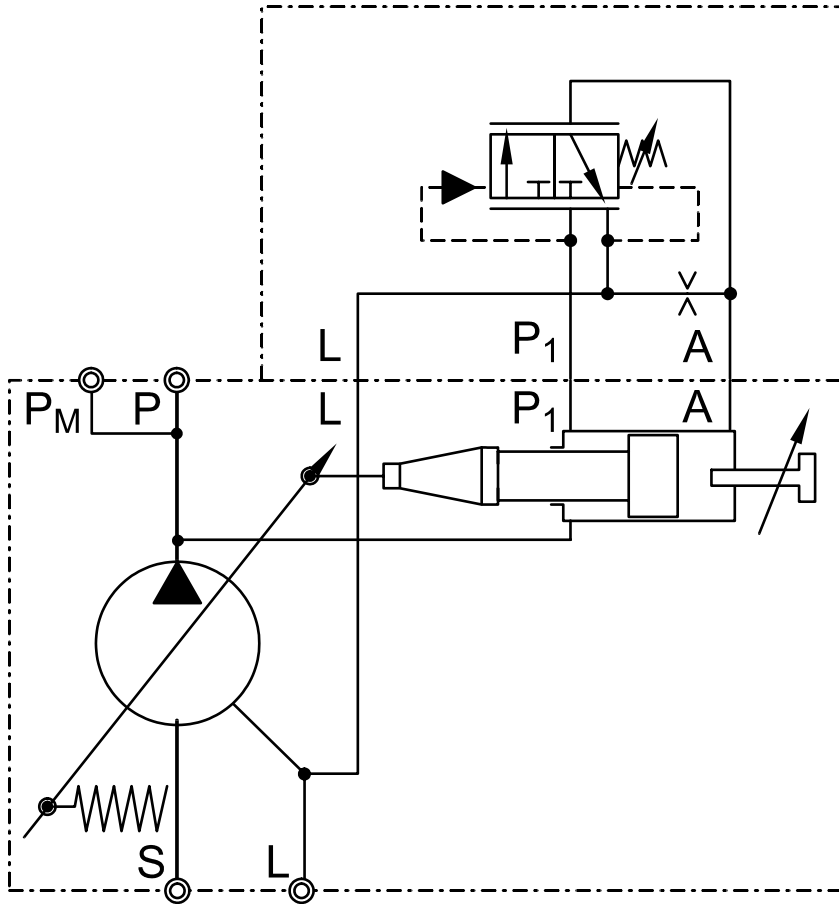
$p < p_{Set}$




$p = p_{Set}$

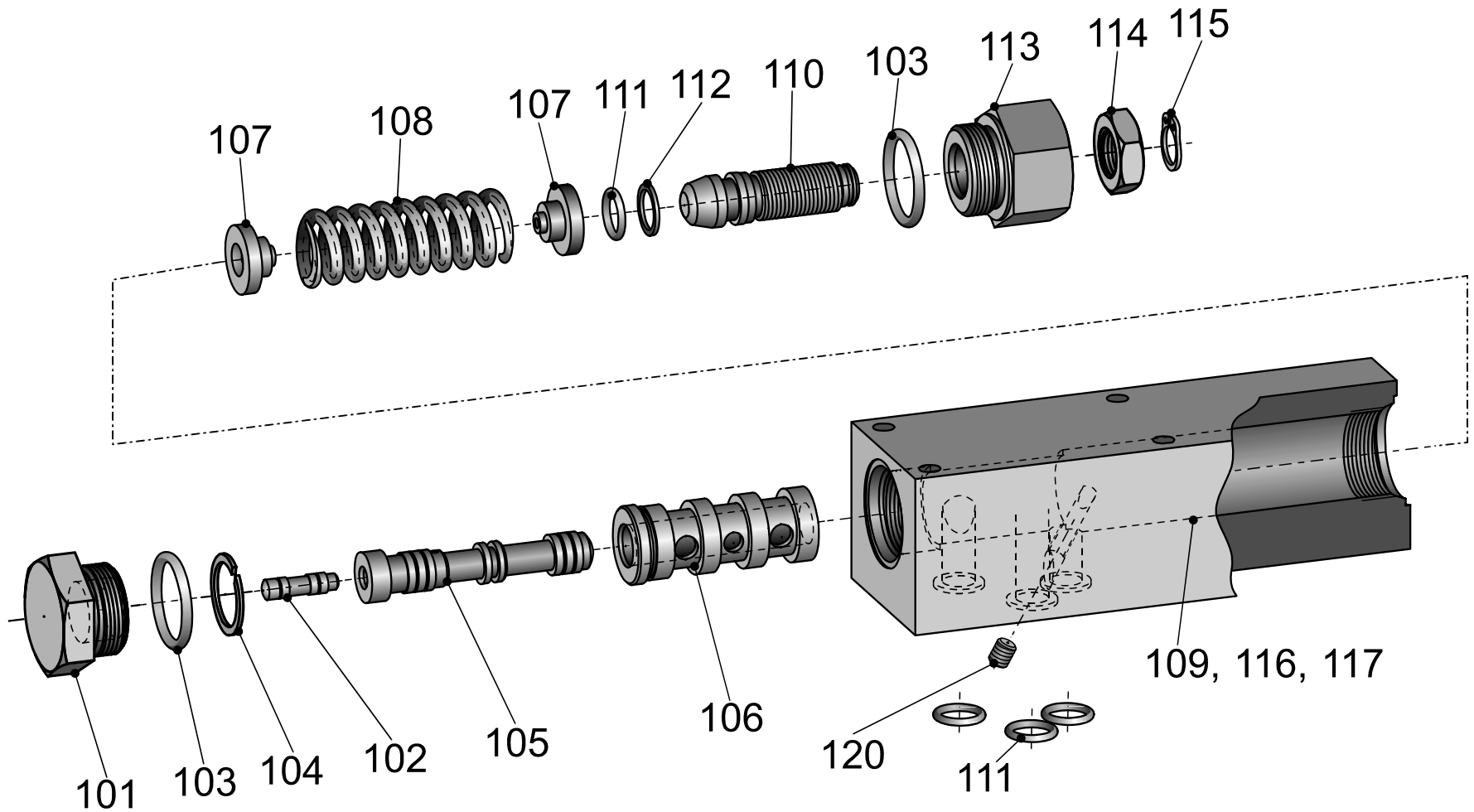


Standard pressure compensator F*S



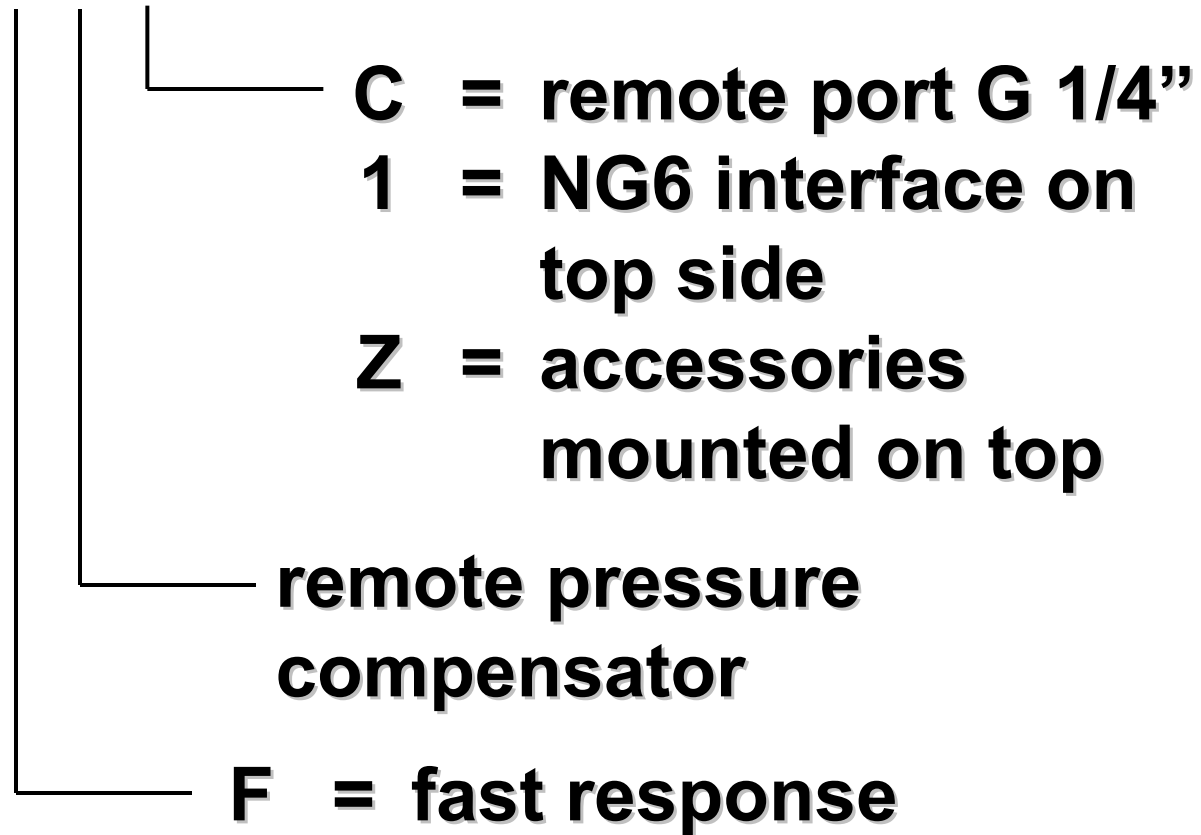
 = included

Standard pressure compensator F*S

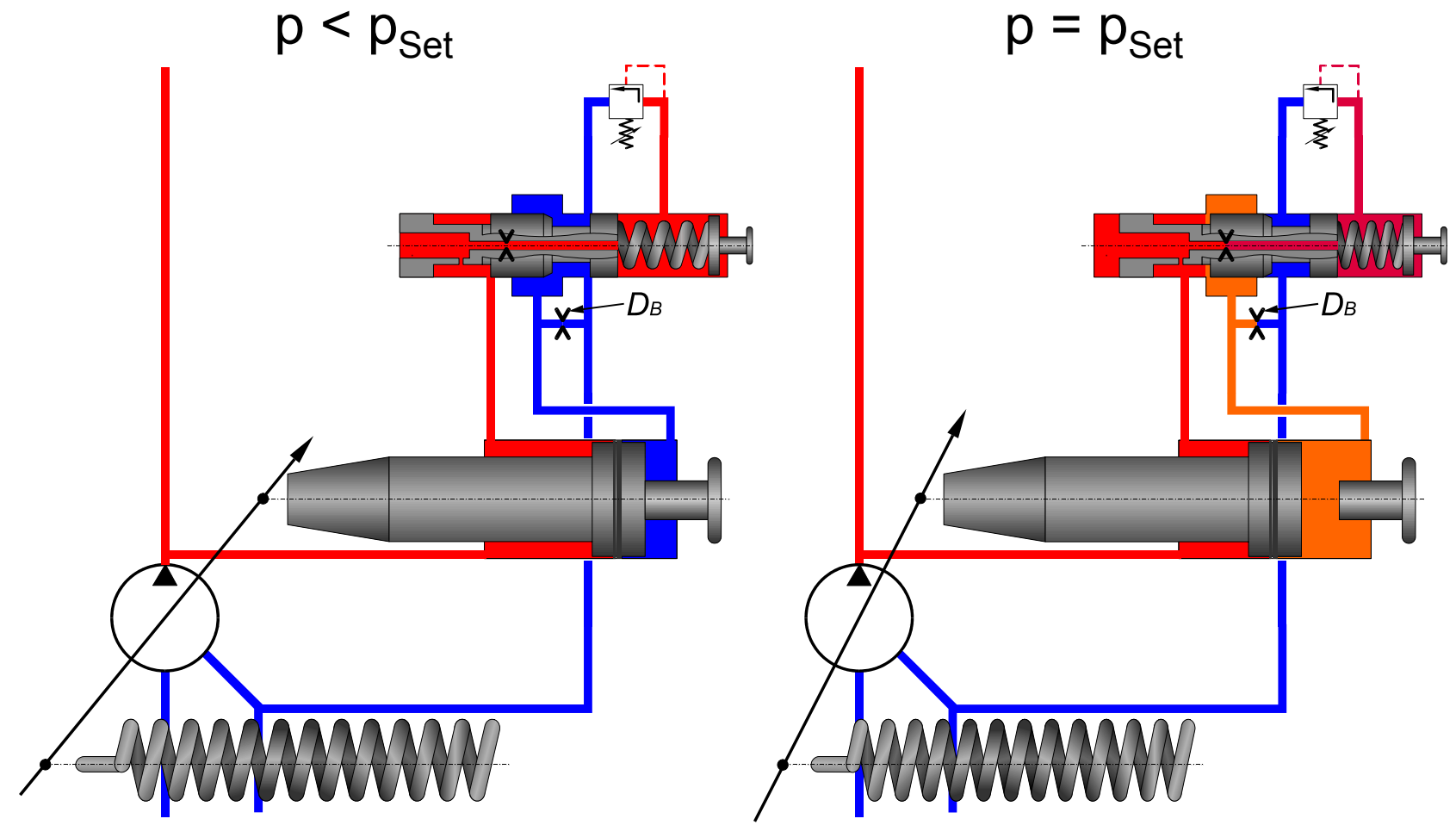


Remote pressure compensator, code *FR, ordering code**

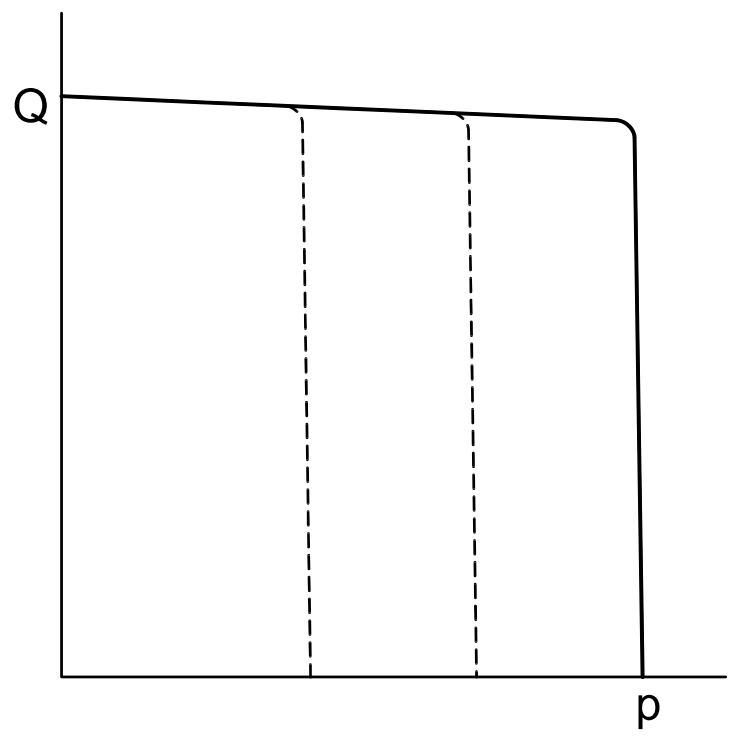
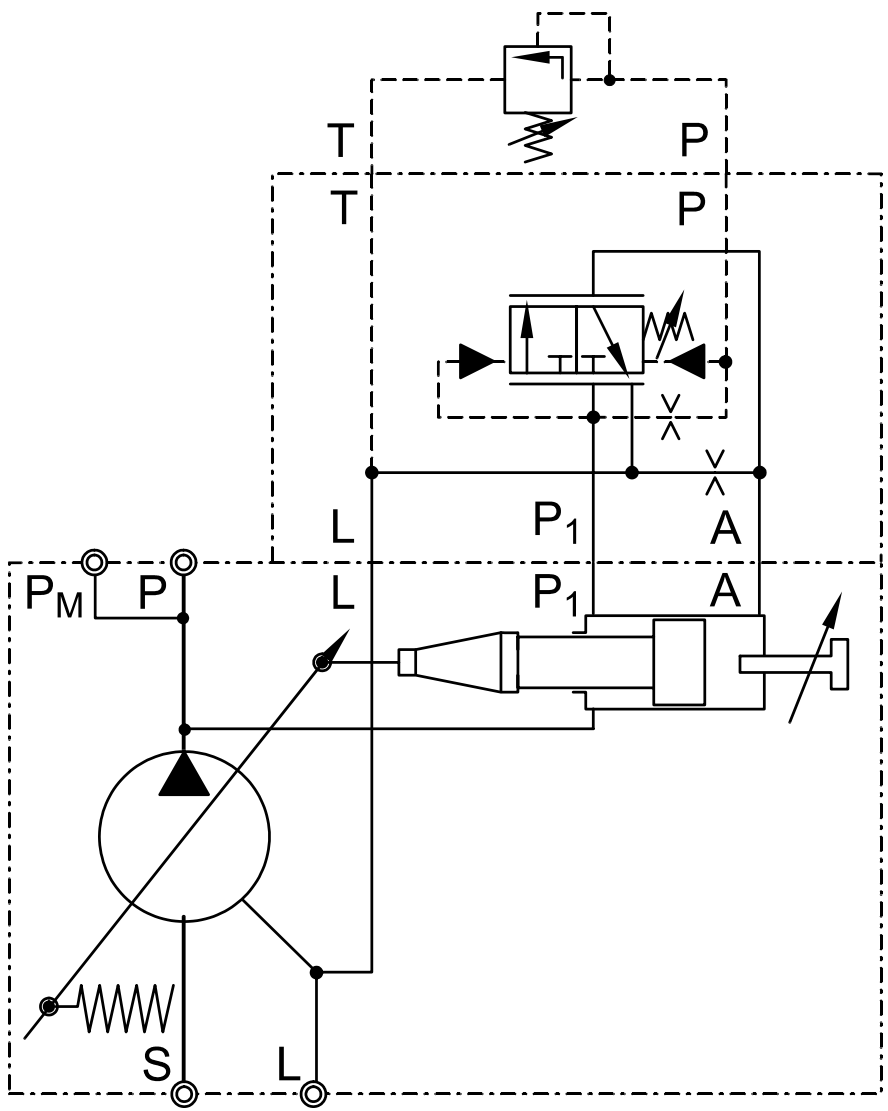
PV046R1K1S1N**FR***




Remote pressure compensator FR1

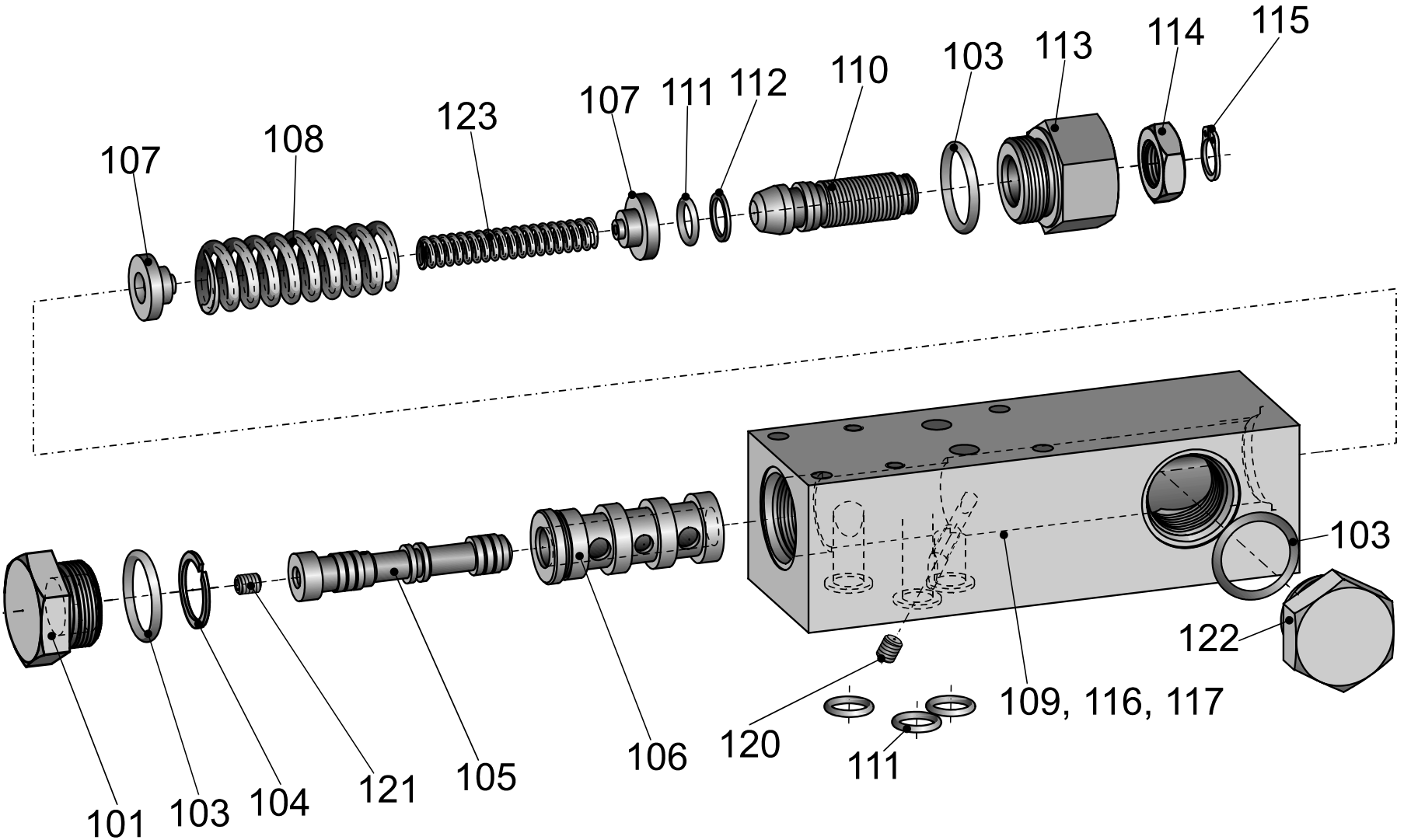


Remote pressure compensator FR1

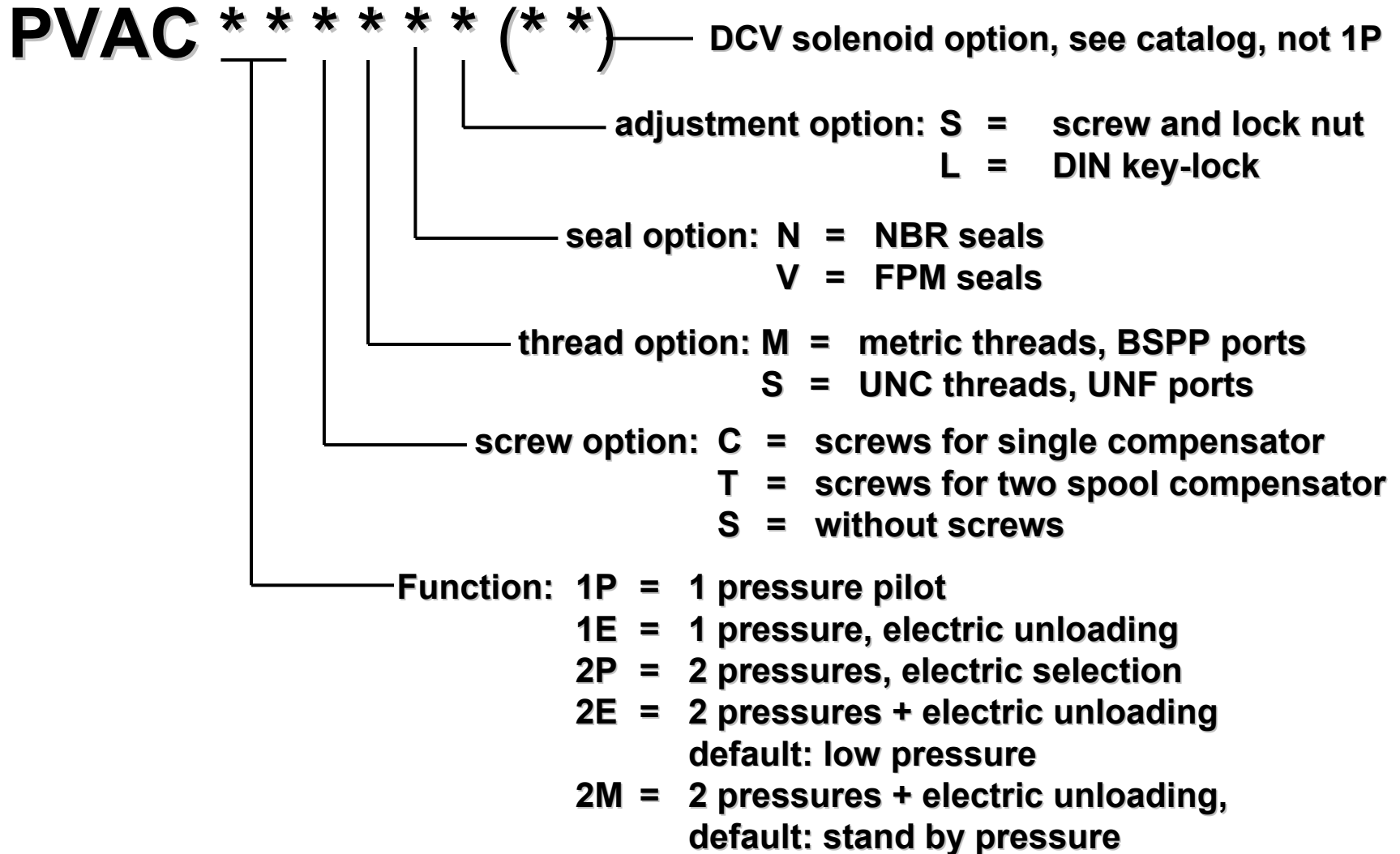


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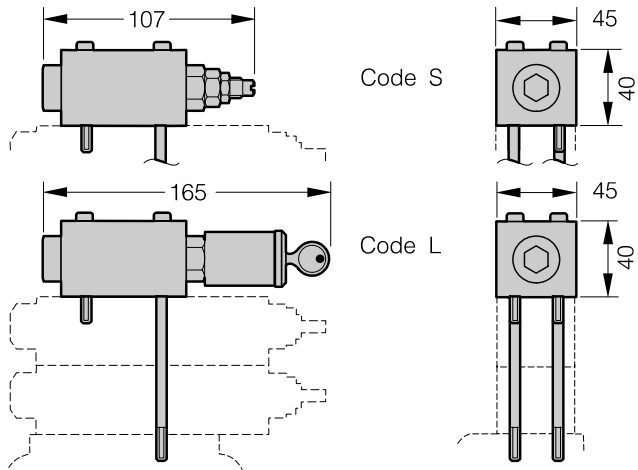
Remote pressure compensator FR1



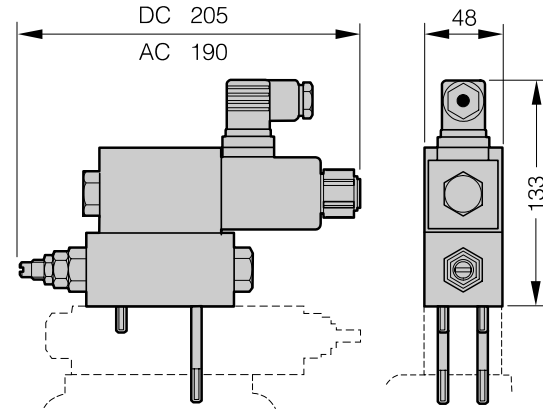
Compensator accessories, ordering code



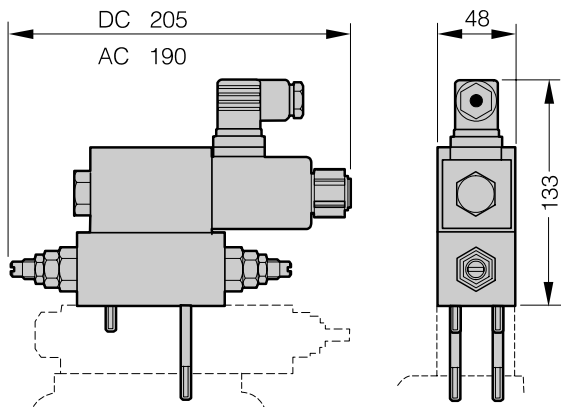
Compensator accessories, dimensions



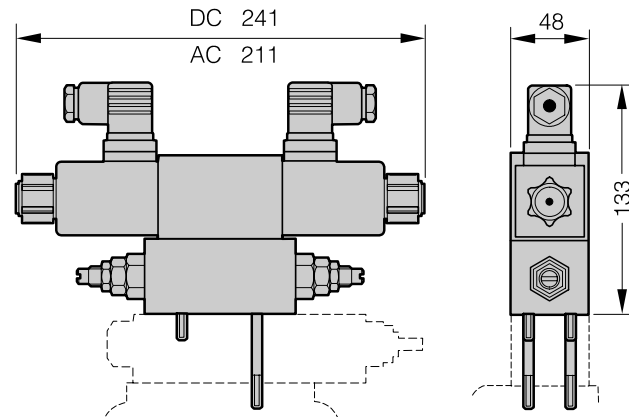
PVAC1P



PVAC1E

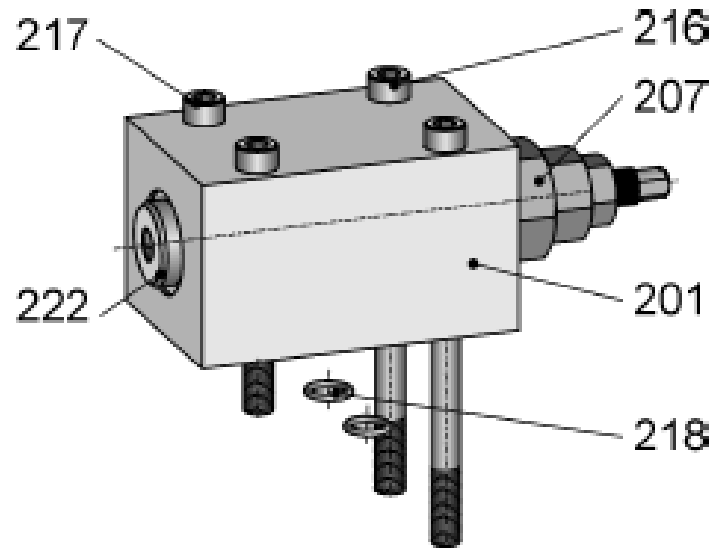


PVAC2P



PVAC2E

Pressure Pilot Valve PVAC



Load sensing compensator, code FF*, ordering code

PV046R1K1S1N**FF** *

C = load sensing
port G 1/4"

1 = NG6 interface on
top side

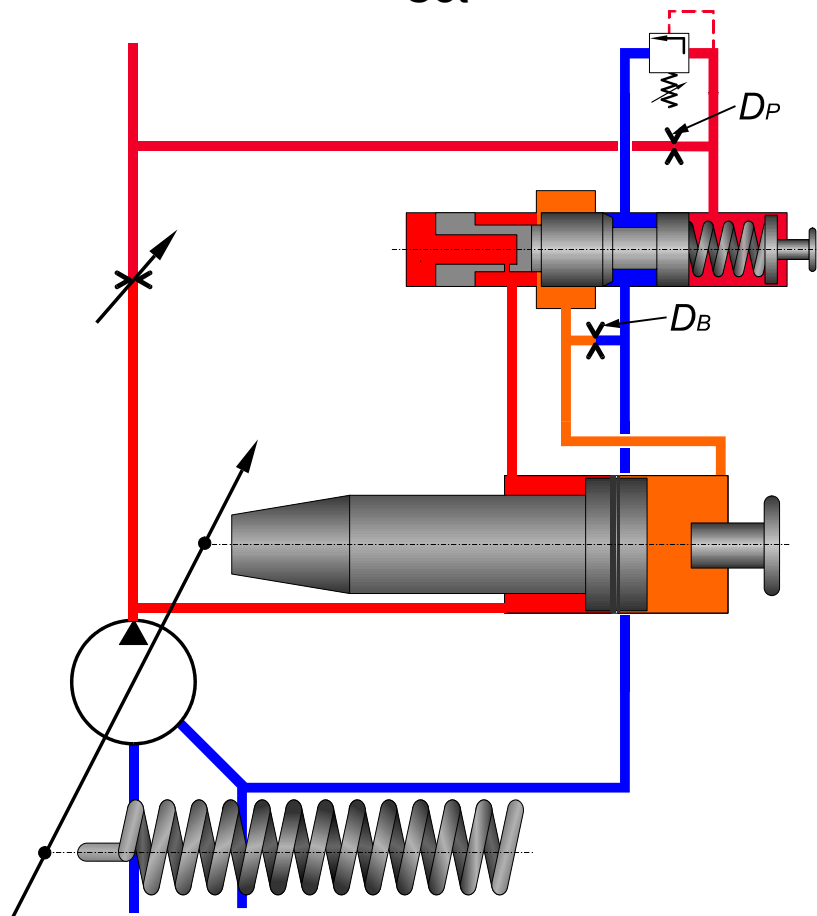
Z = accessories
mounted on top

load sensing
compensator

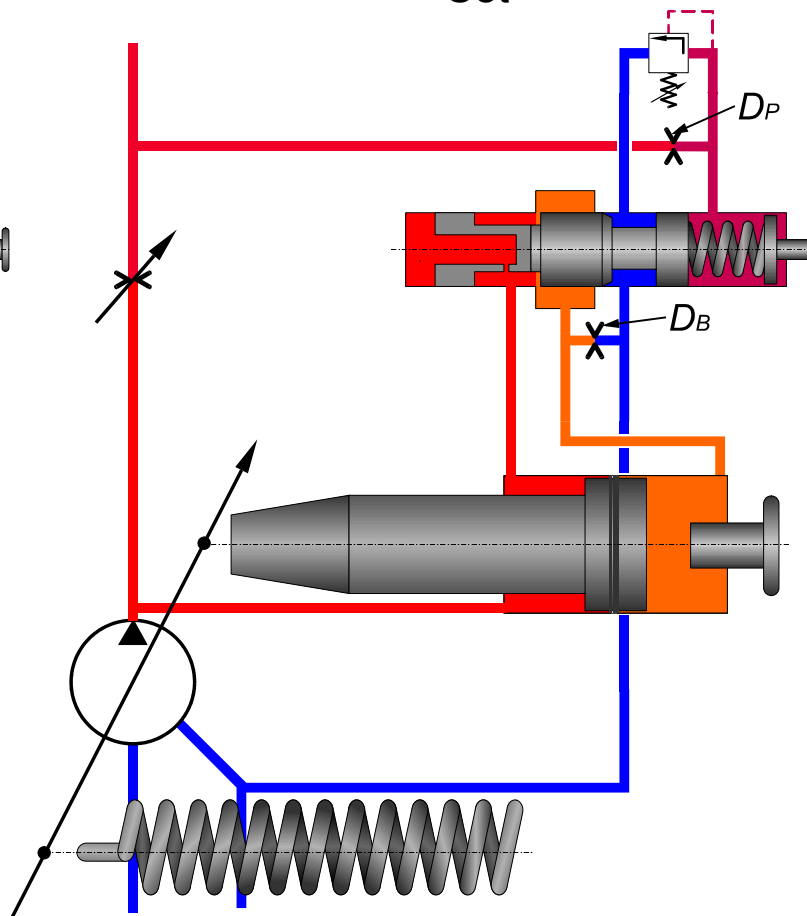
F = fast response

Load sensing compensator FF1

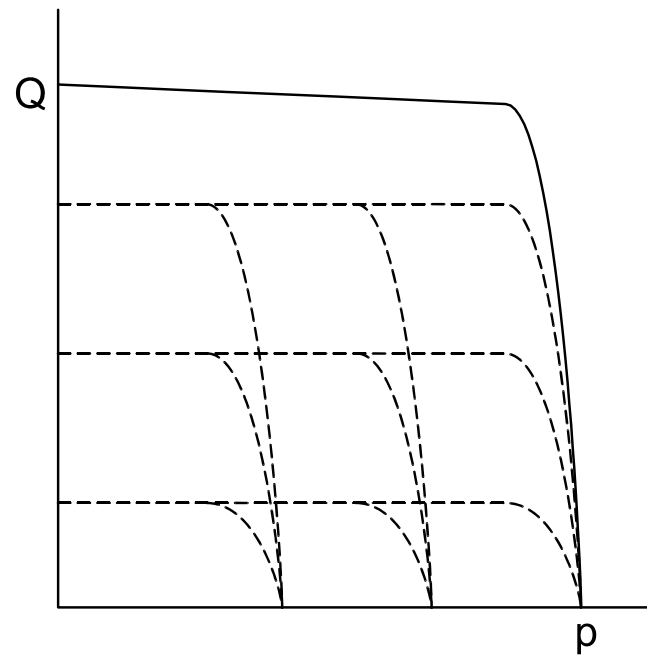
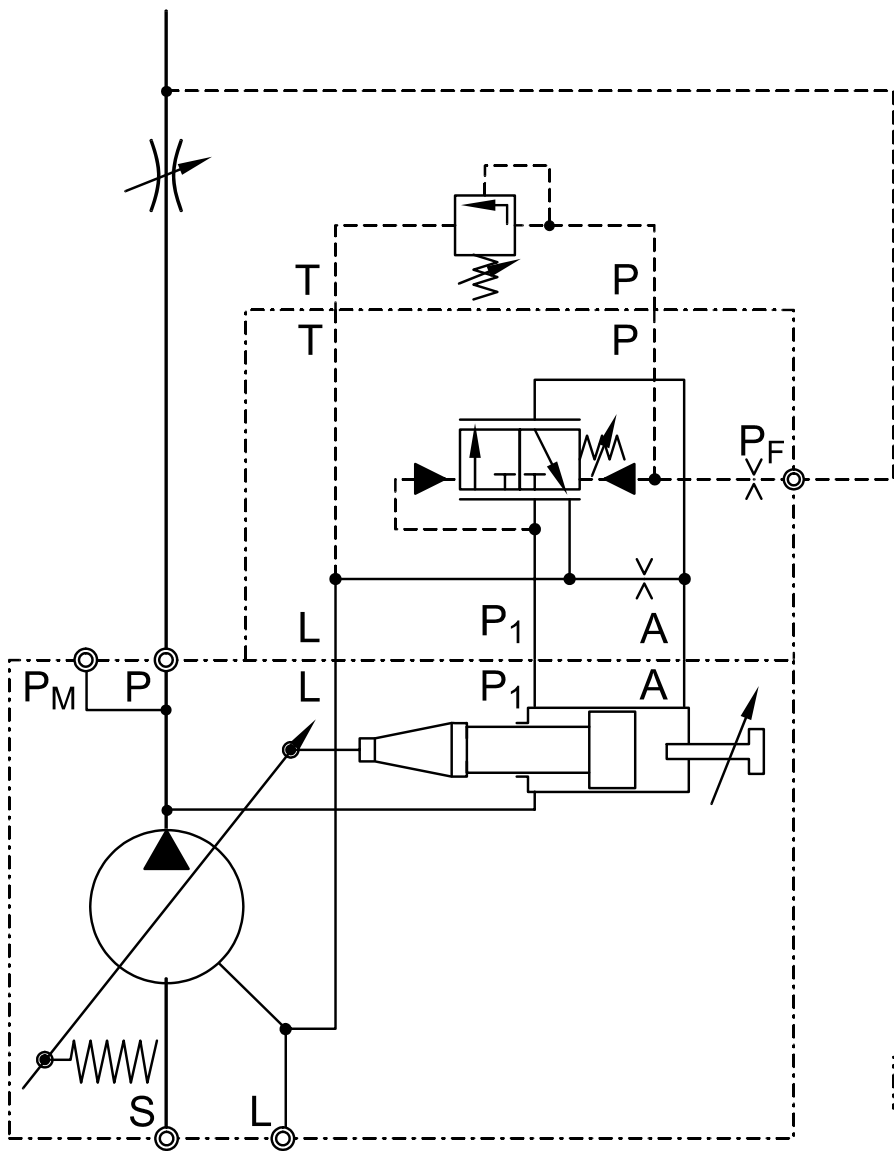
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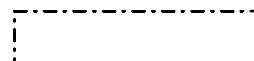


$p = p_{Set}$

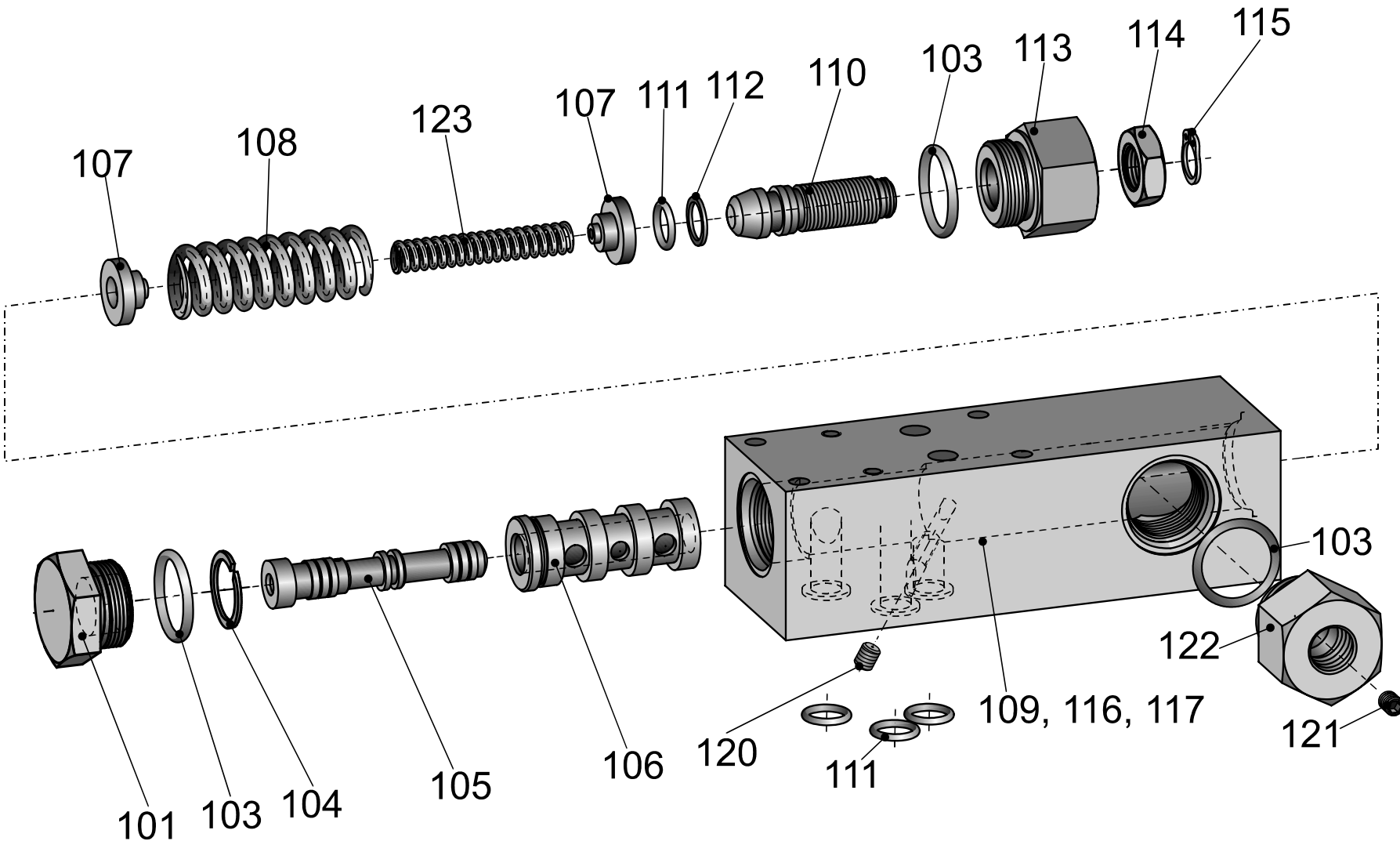


Load sensing compensator FF1

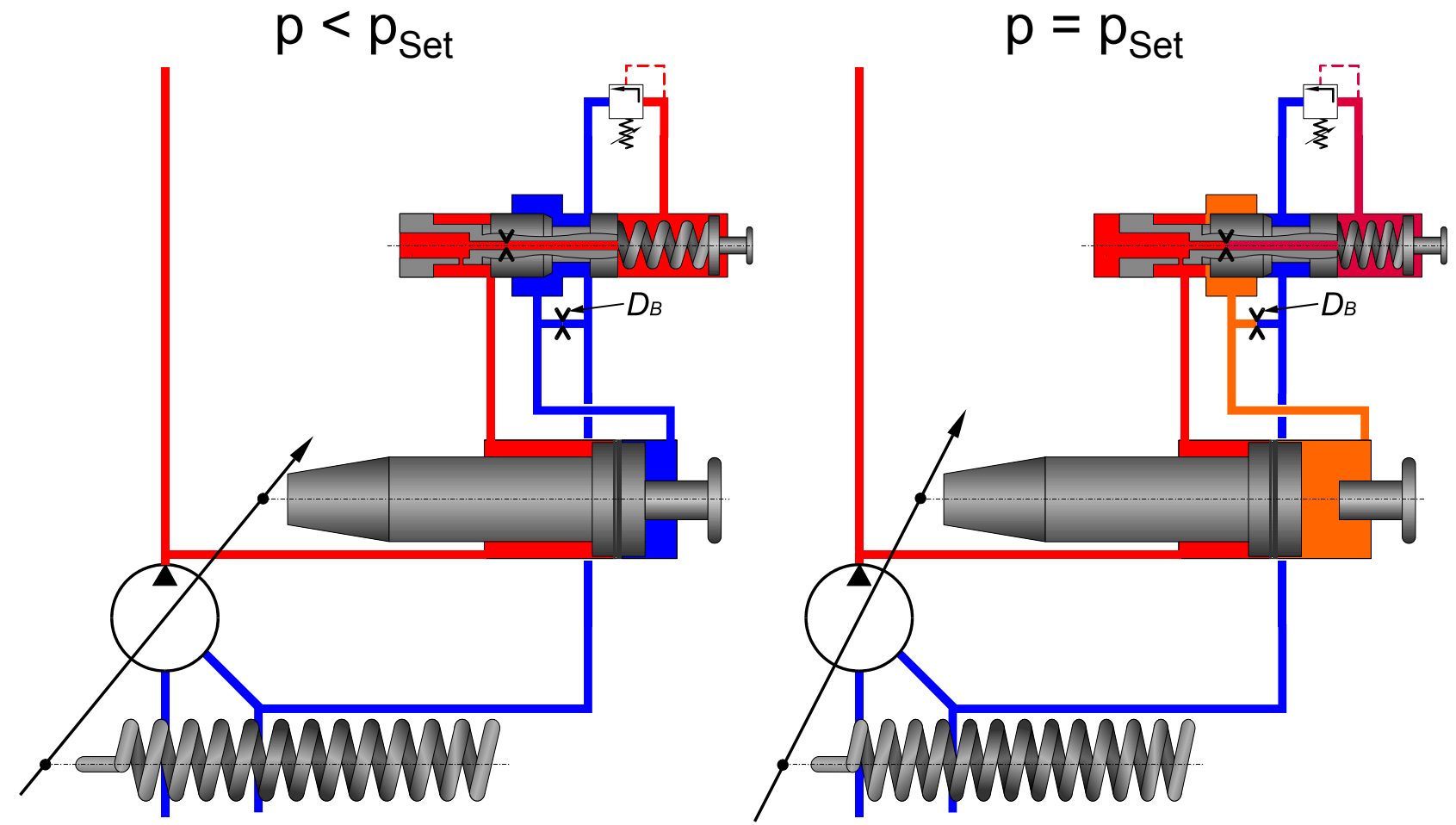


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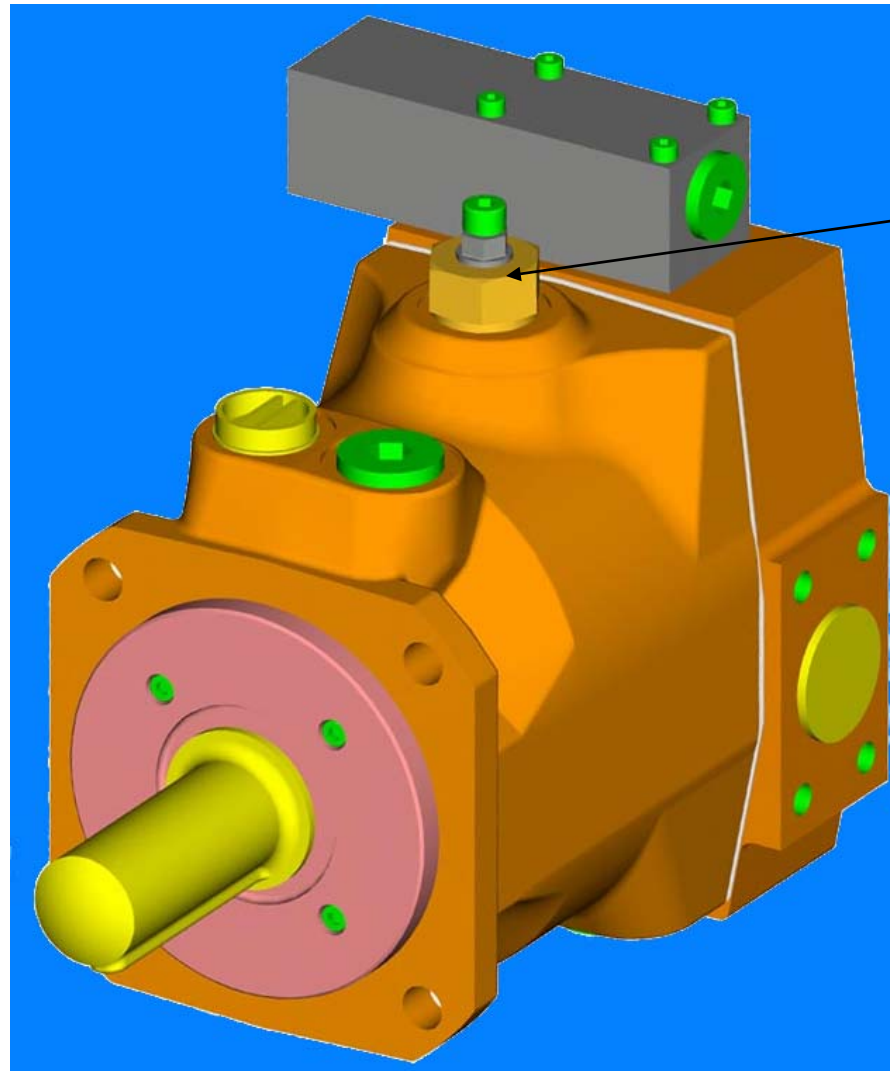
Load sensing compensator FF1



Remote pressure compensator FR1

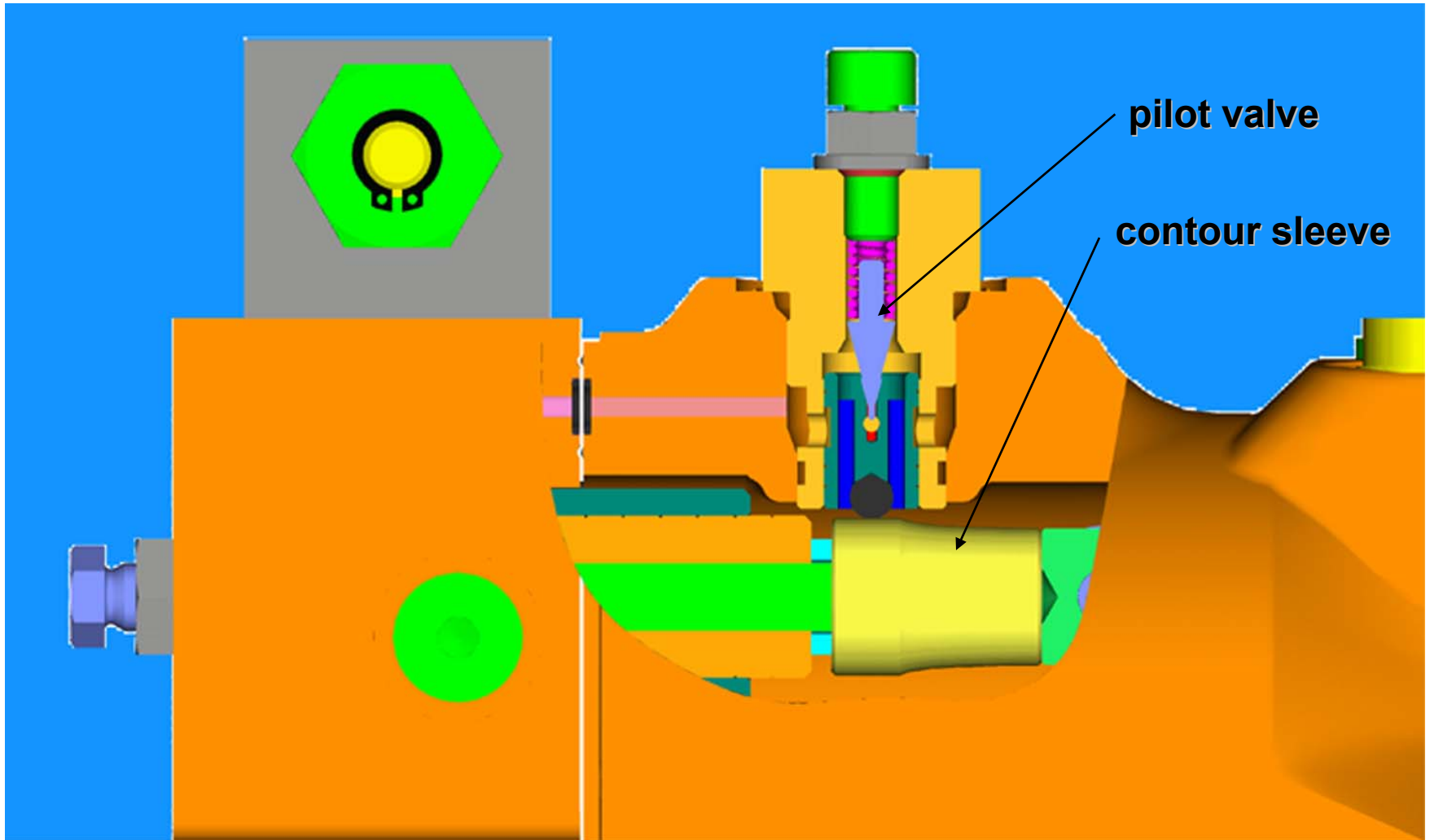


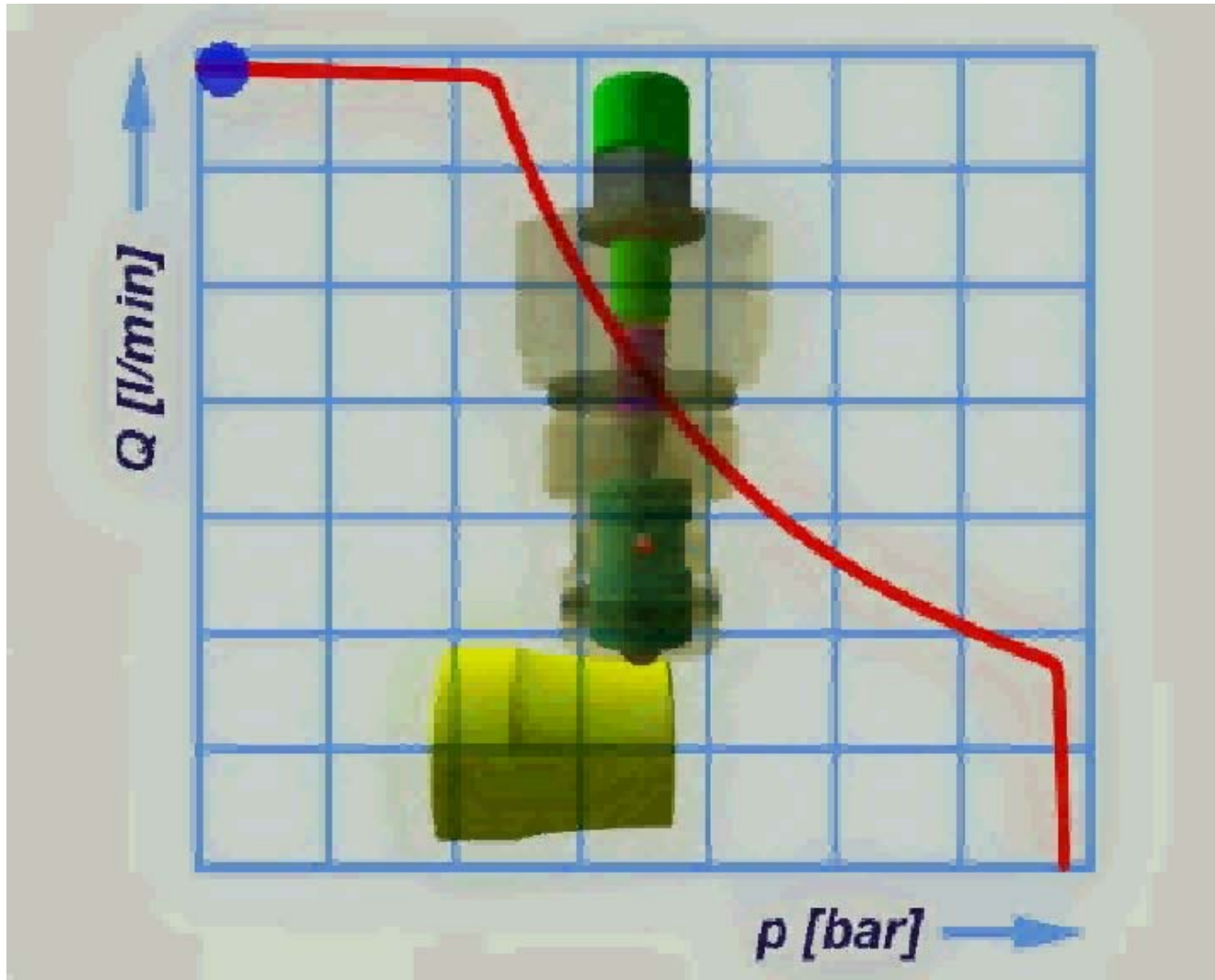
PV Horsepower Control



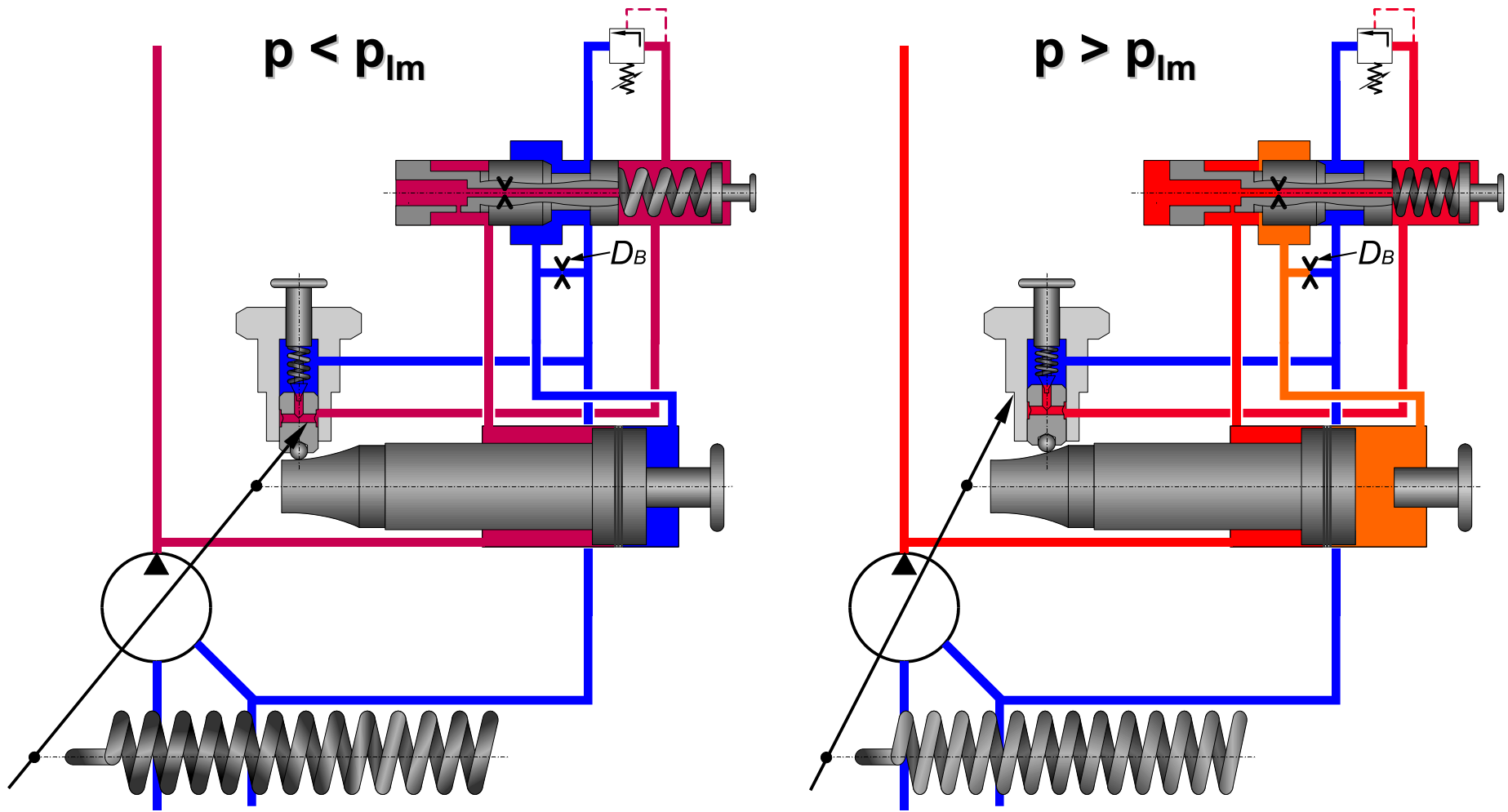
pilot cartridge

PVplus Series, Section

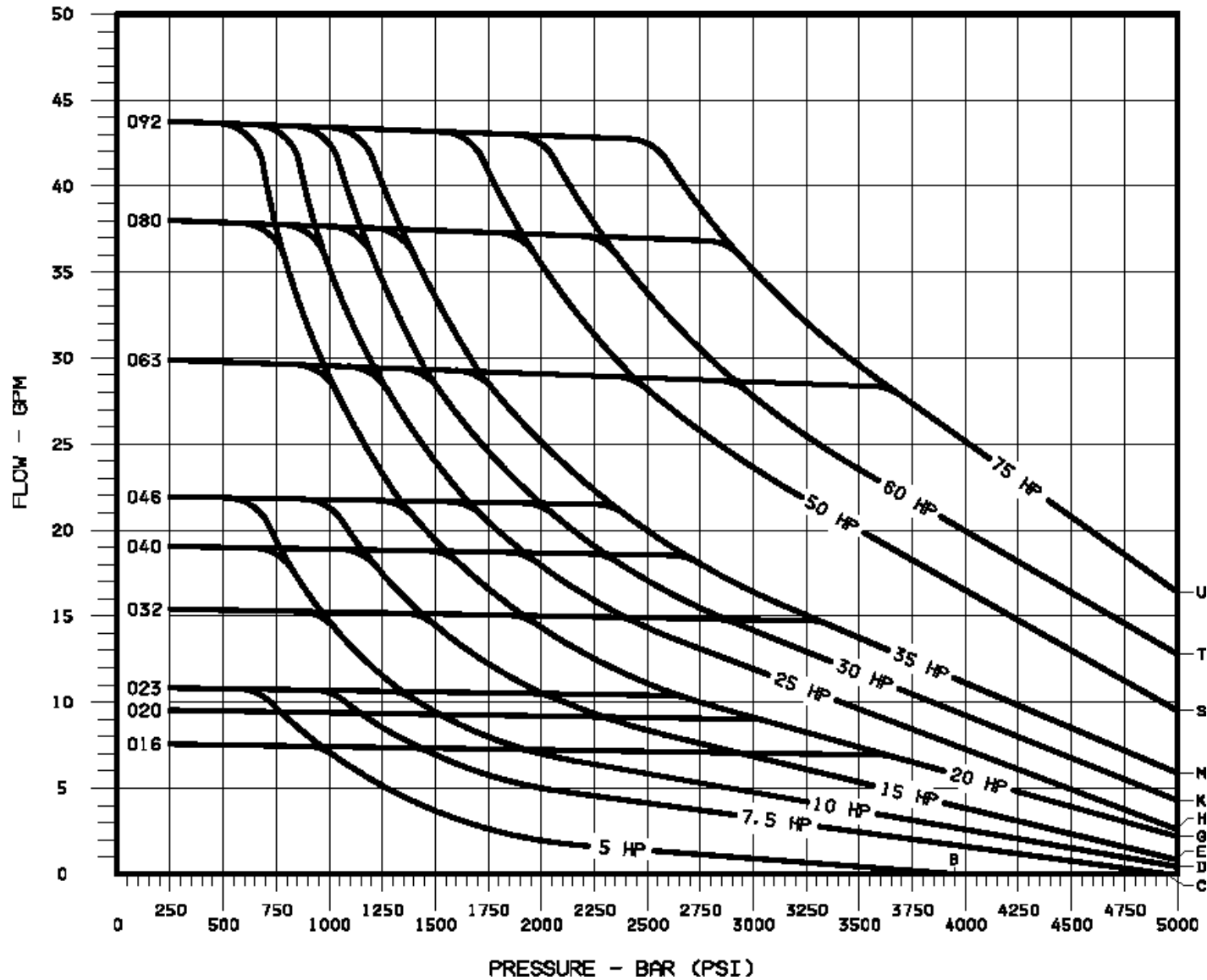




Hydraulic Function



APPROXIMATE HORSEPOWER CURVES
 PV016/020/023 PV032/040/046 PV063/080/092
 @ 1800 RPM



- **Integrated design**
- **No external piping**
- **Easy to install**
- **No specials for thru drive pumps**
- **Contour sleeves easy to change**

Note:

For load-sensing systems a different version needs to be ordered.

The external piping of the former version allowed direct connection to the load-sensing port of the main line directional control or throttle valve.

Now the (standard) L-version has no load-sensing port at the compensator valve.

For load-sensing the C-version must be ordered.

U.S. Model Code



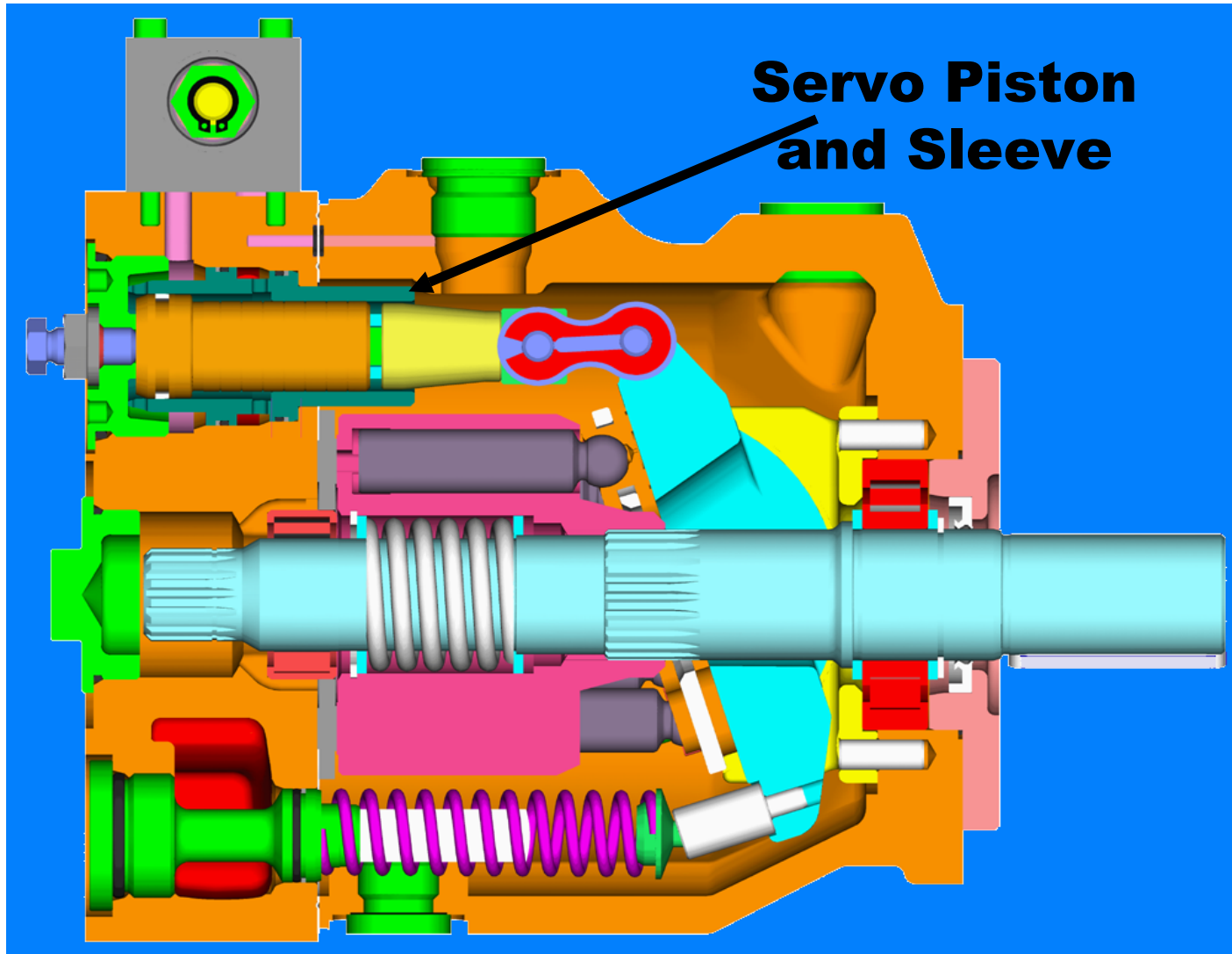
Adobe Acrobat
Document

German Model Code

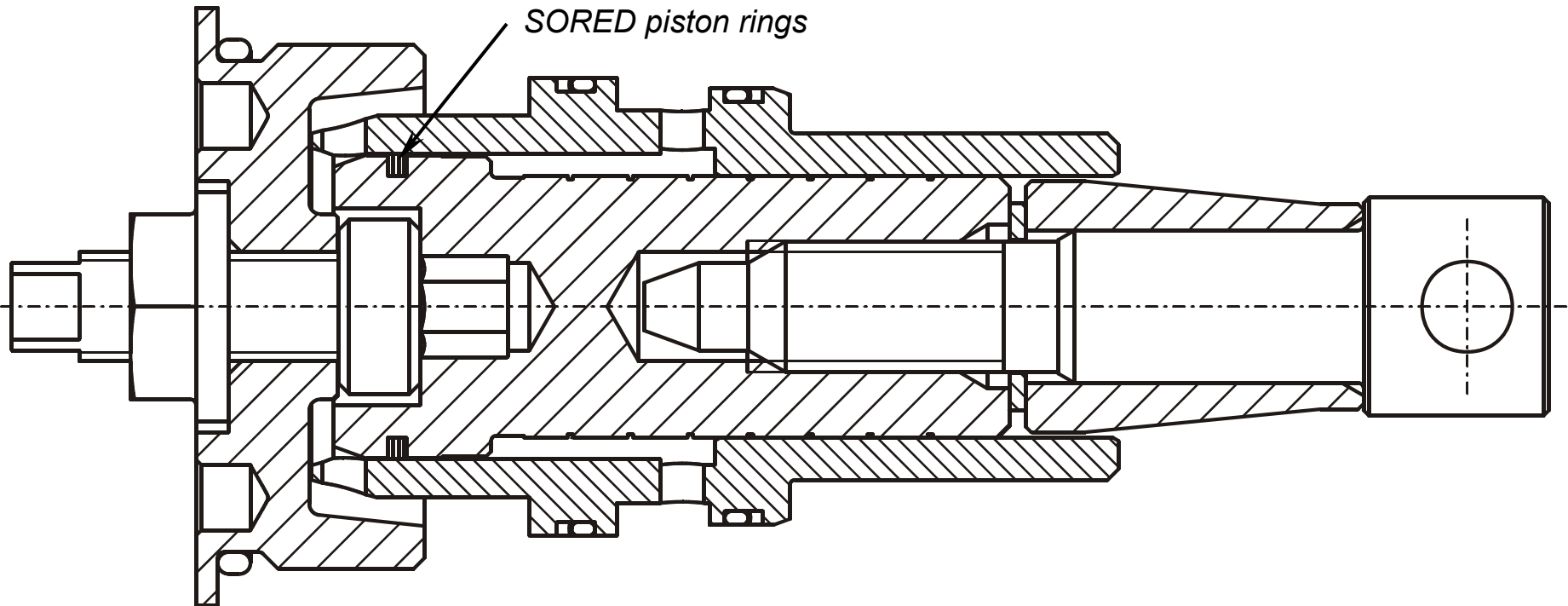


Adobe Acrobat
Document

PV Servo Design Changes



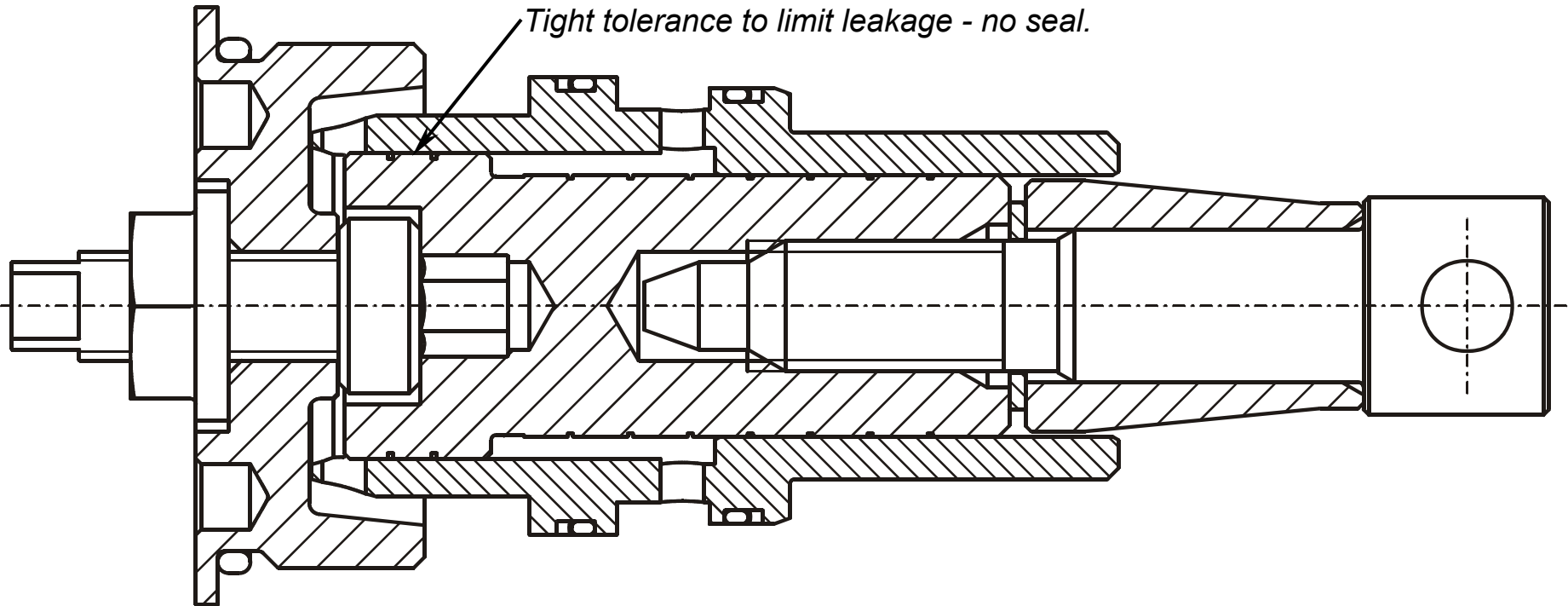
Servo Piston, Steel Piston Rings



Problem: under high pressure and no motion the piston rings are pressed into the surface roughness of the sleeve. Under very slow motion the rings start to wear into the servo sleeve rather than glide.

Applications with large accumulator/servo systems exhibit these parameters.

Servo Piston, Tight Tolerance



- ***Lead Time is 4 weeks for standard pumps.***
- **SAE version pumps w/ standard control options are stocked in Otsego.**
 - **Control options include:**
 - **Pressure Compensated**
 - **Load Sense**
 - **Remote**
- **Extended lead time on Horsepower, and electro-hydraulic options.**

Thank You!!!!