

# Hydraulic System

*Customer Service Department*

Pag. 1 di 20

**FLOW:** *determines the **speed** of the work equipment.*

Speed of work equipment is determined by the amount of pump flow.

Greater the pump flow the greater the speed.

Lesser pump flow creates slower speeds.

Pump flow rate is determined by the pump swash plate angle and rpm.

**PRESSURE:** *determines the amount of **force** the work equipment can exert.*

Pressure is determined by resistance up until maximum relief pressure is reached.

Resistance can come in two forms:

Flow rate and size of port the oil must pass through.

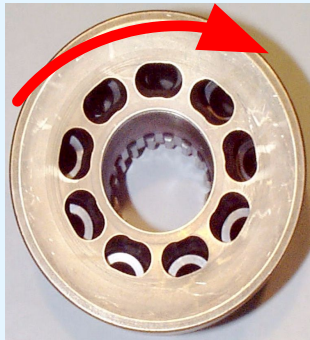
Amount of resistance from the work equipment.

When maximum relief pressure is reached the machine cannot exert any more force and the work equipment stops.

### Pump RPM



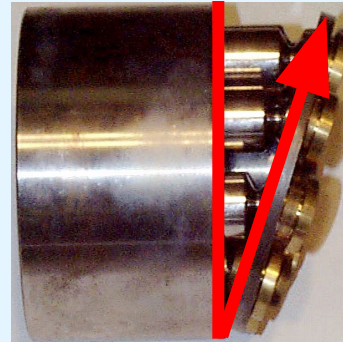
When the pump **rotation speed increases**, the pump flow increases. This is directly effected by engine rpm.



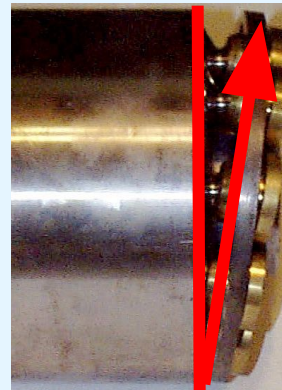
When the pump **rotation speed decreases**, the pump flow decreases. This is directly effected by engine rpm.

This is valid also for the gear pump not represented here

### Pump Swash Plate Angle

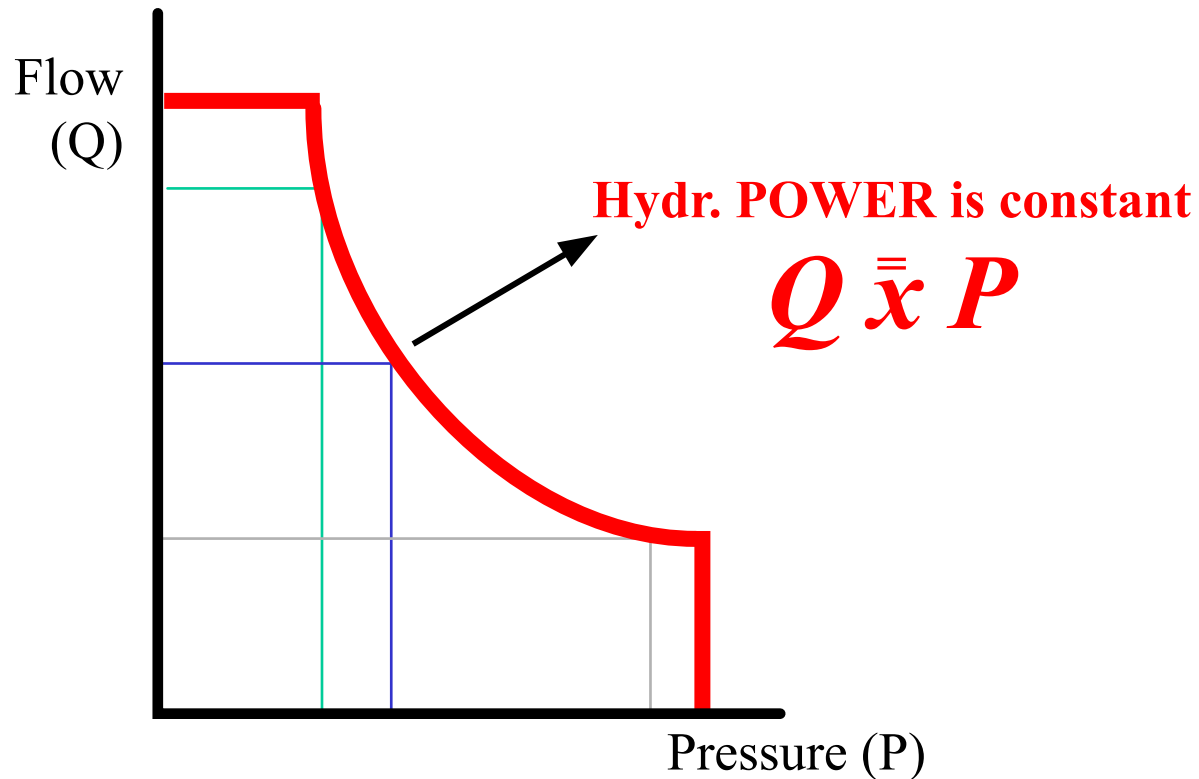


As the pump **swash plate angle increases** more fluid can fill each chamber increasing the flow.



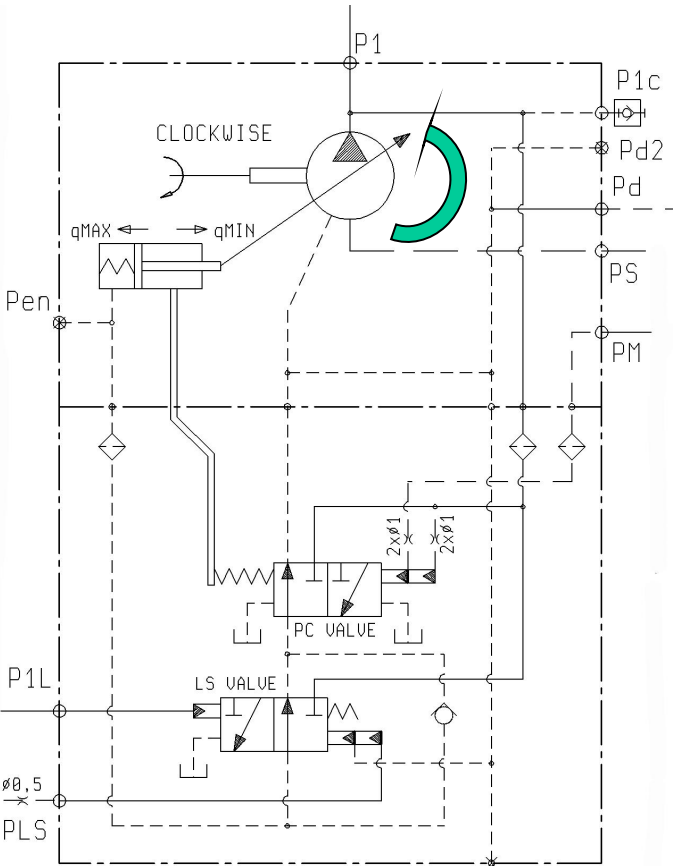
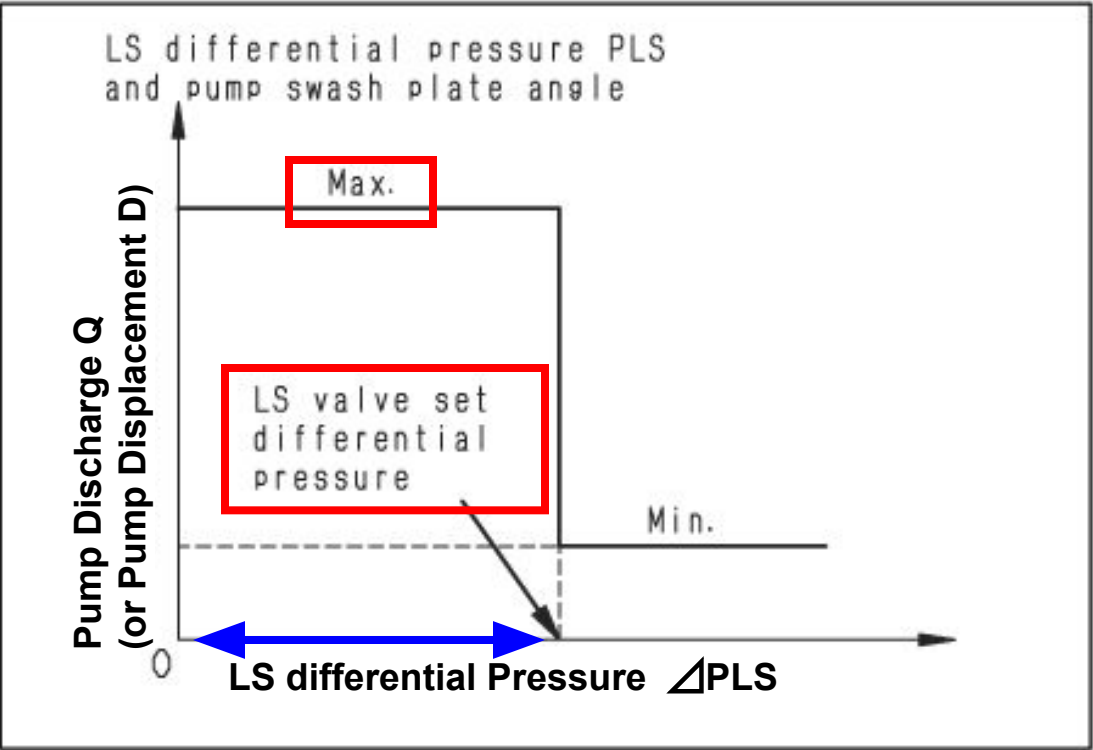
As the pump **swash plate angle decreases** less fluid can fill each chamber decreasing flow.

The relationship between flow and pressure is shown in the Hydraulic Output Curve. With all hydraulic equipment the relationship between flow and pressure is inversely proportional: as pressure increases flow decreases and as pressure decreases flow increases.

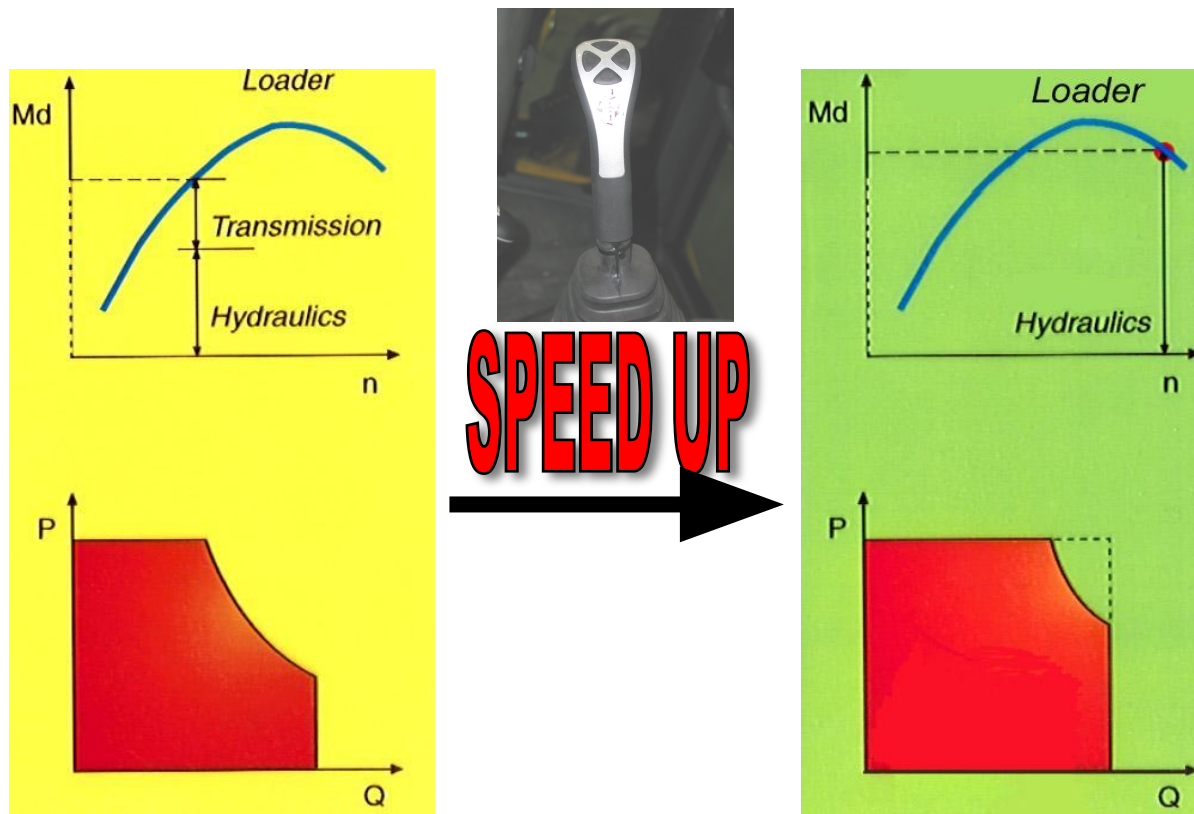




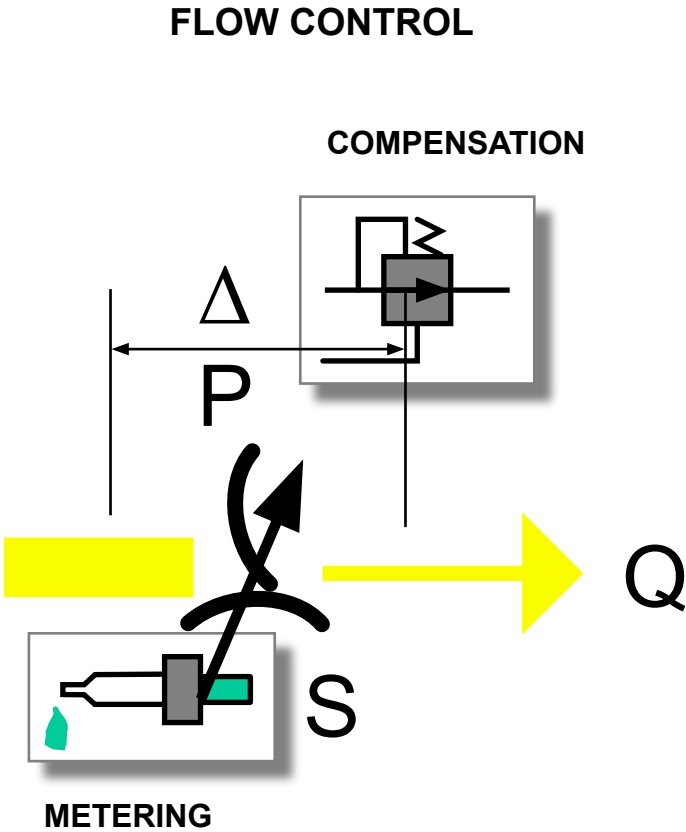
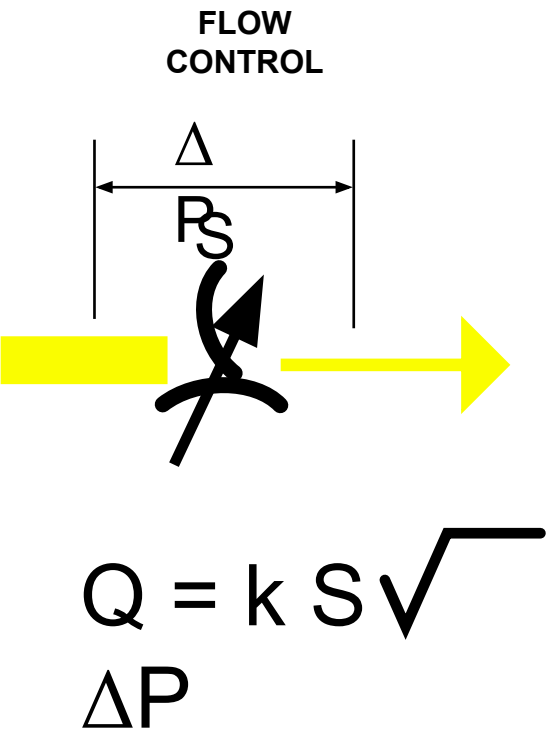
<If the  $\Delta PLS$  is lower than the  $\Delta PLS$  set pressure>







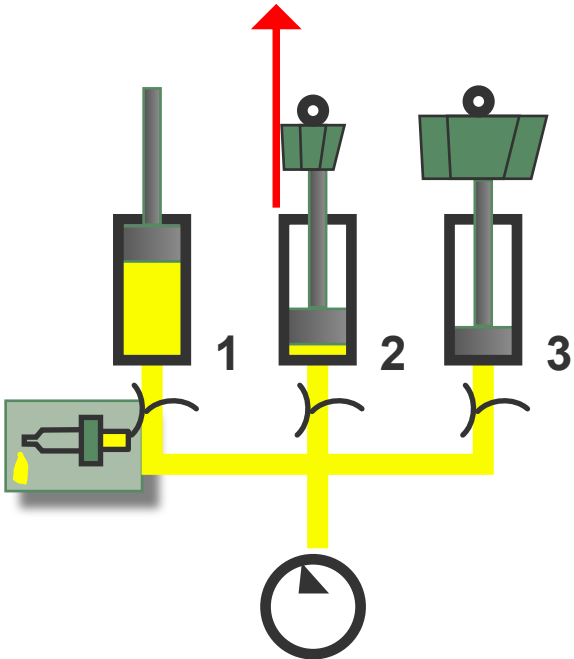
- **POWER MODE & SPEED UP ADVANTAGES:**
  - PERFECT CONTROL OF THE AVAILABLE POWER
  - NO ENERGY LOSS AND COSTS SAVING
  - SELF-ADJUSTMENT SYSTEM ACCORDING TO THE APPLICATION
  - OVERDIMENSIONED COMPONENTS TO GUARANTEE RELIABILITY AND DURABILITY
  - WORKING MODE SELECTION LIKE IN KOMATSU EXCAVATORS
  - TWO FRONT LOADER SPEEDS LIKE IN KOMATSU WHEEL LOADERS



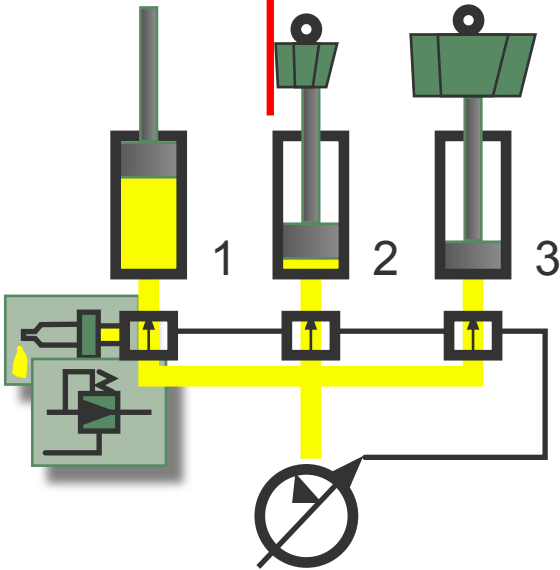


CONVENTIONAL SYSTEM

Flow division without pressure compensator



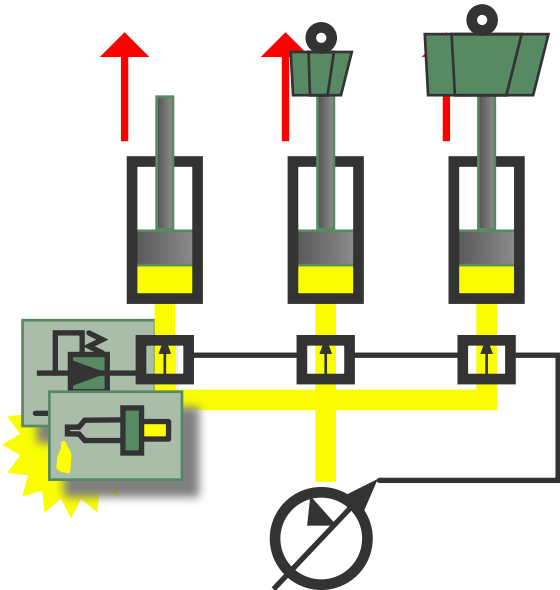
Flow division with pressure compensator



Customer Service Department

THE INNOVATIVE  
SYSTEM  
INSTALLED  
ON THE  
NEW  
KOMATSU  
BACKHOE  
LOADERS

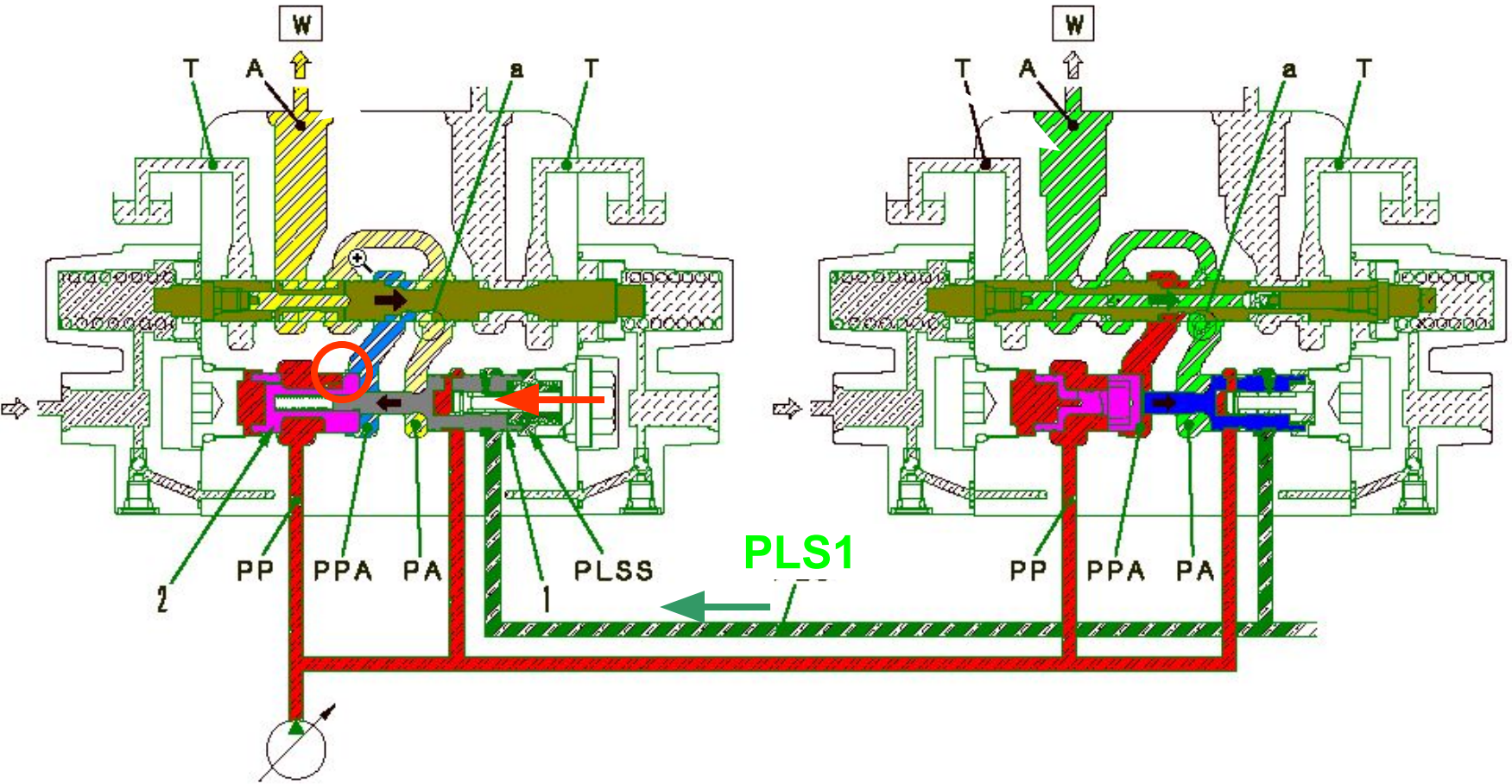
Flow division with



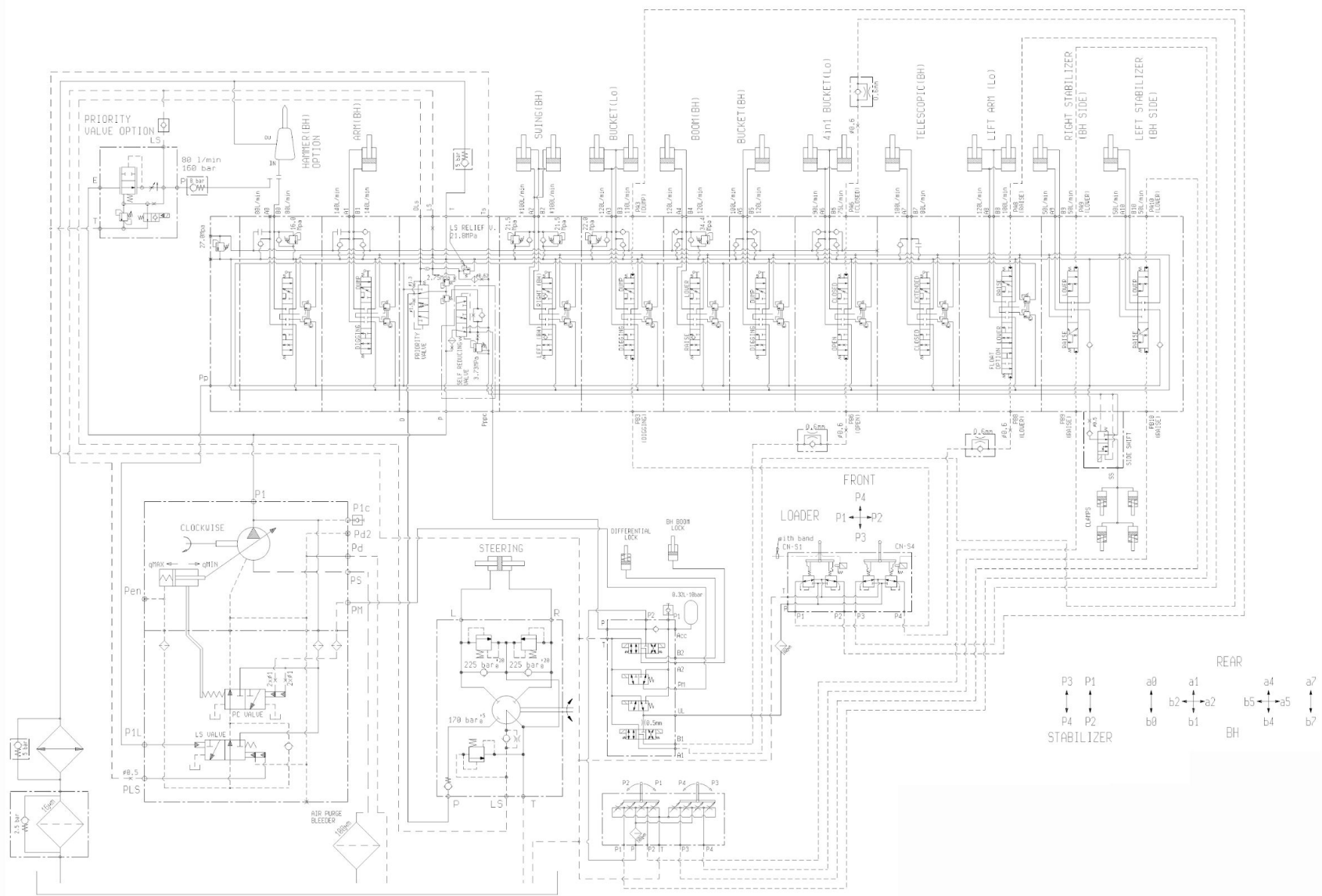


2.Light load  
(Compensated side)     $PLS2 < PLS1$

1.Heavy load  
(Compensating side)



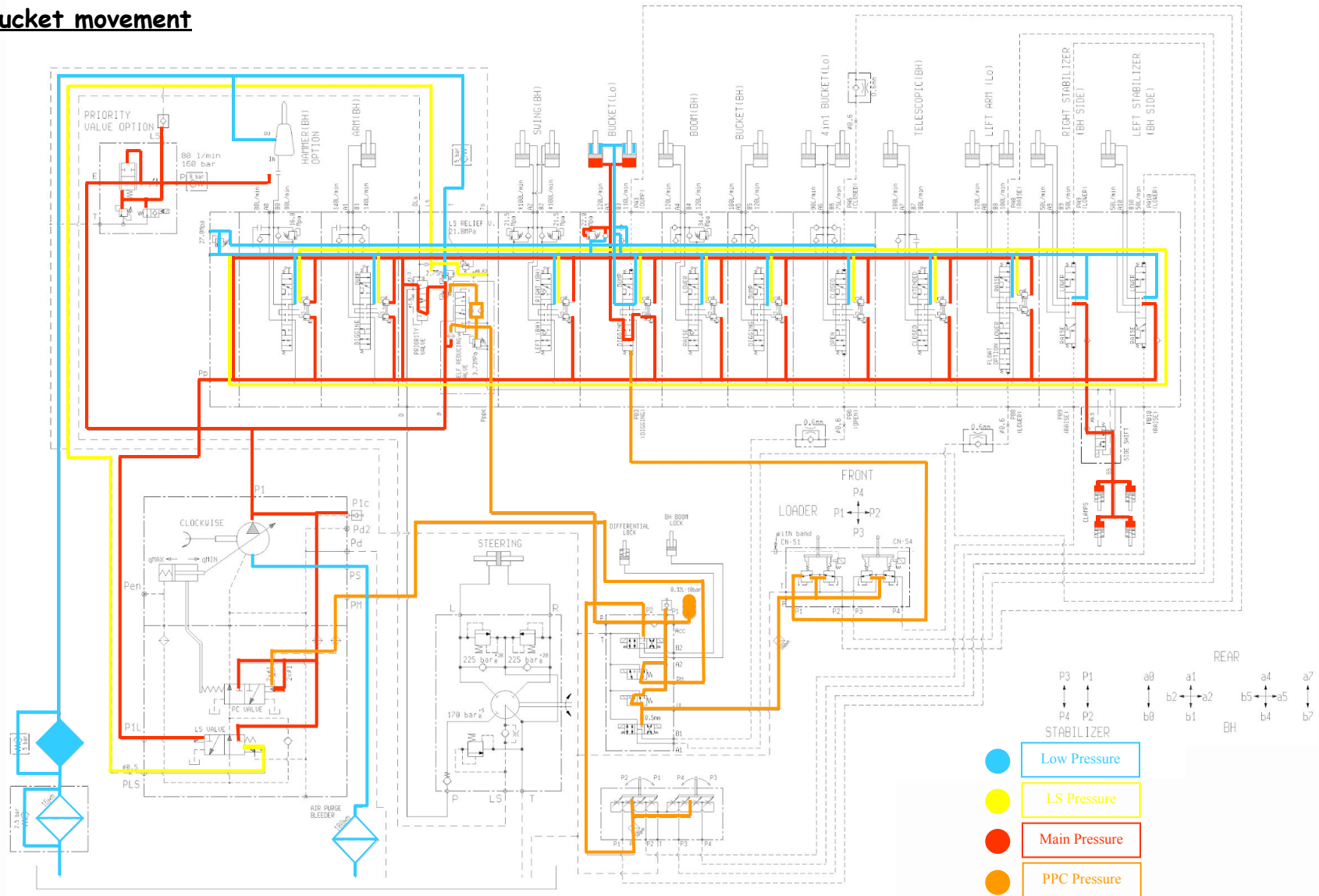
# Hydraulic System : Lay Out



Customer Service Department

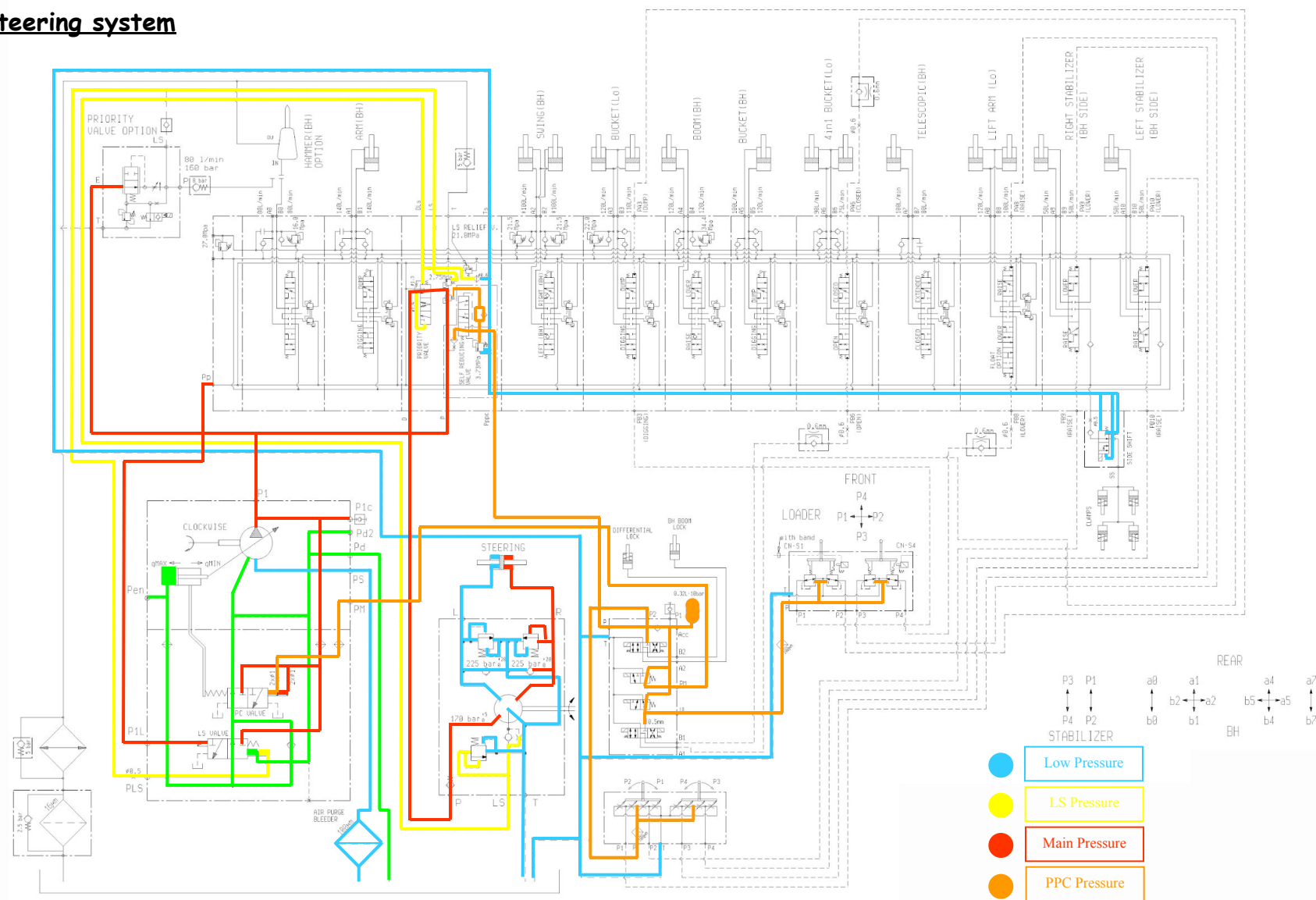


Bucket movement



Customer Service Department

Steering system



Customer Service Department

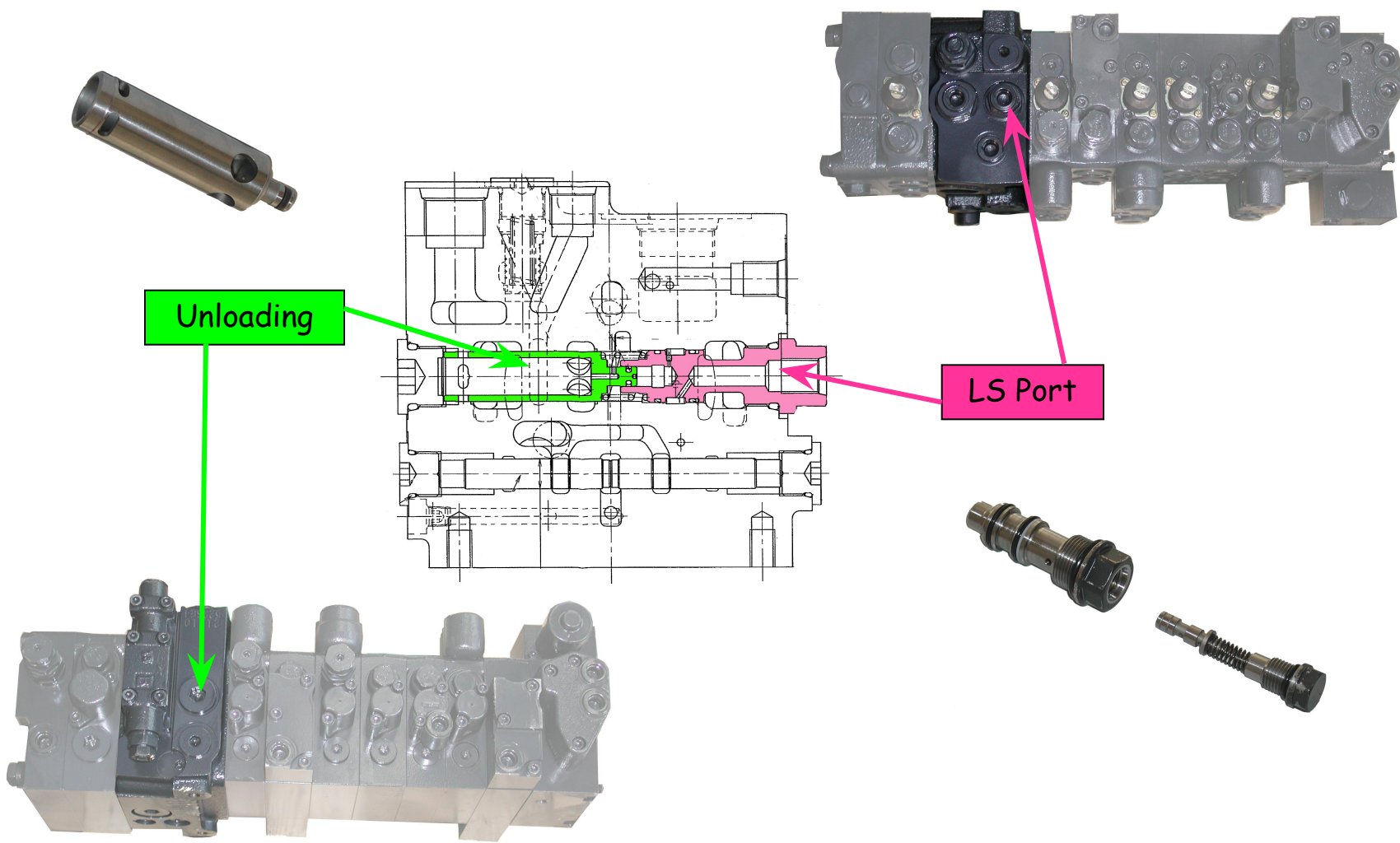


✱



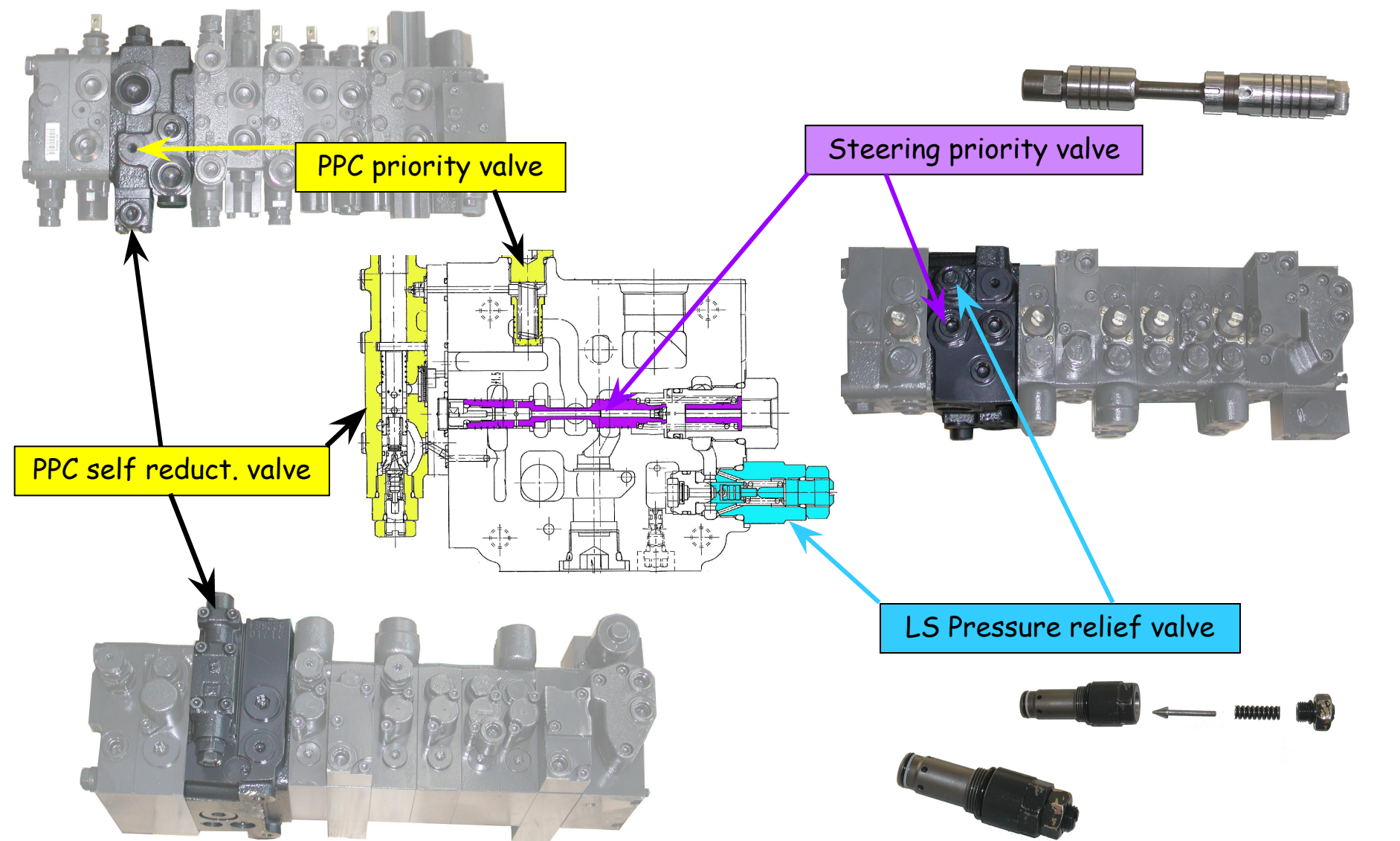
## \*





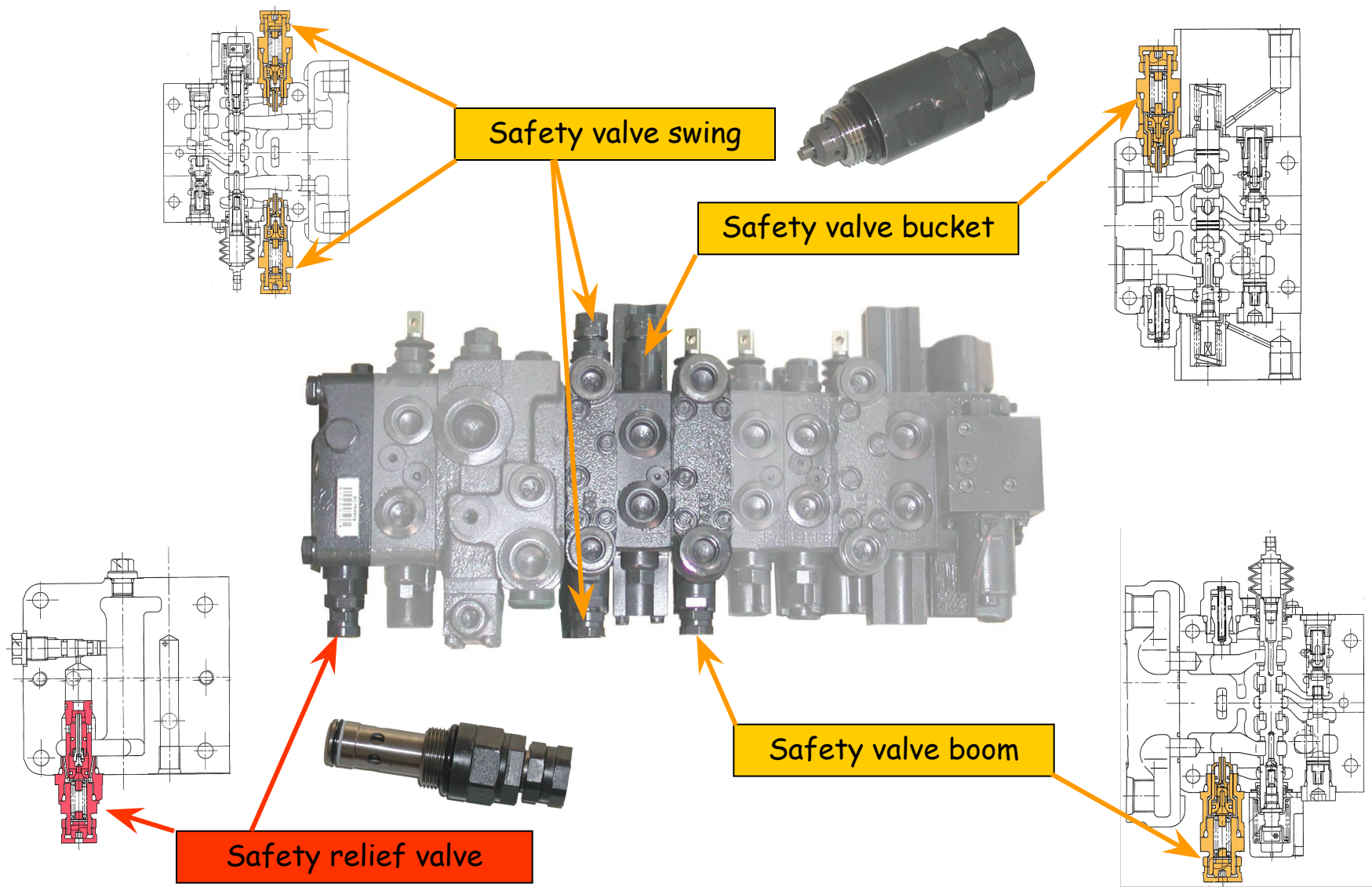


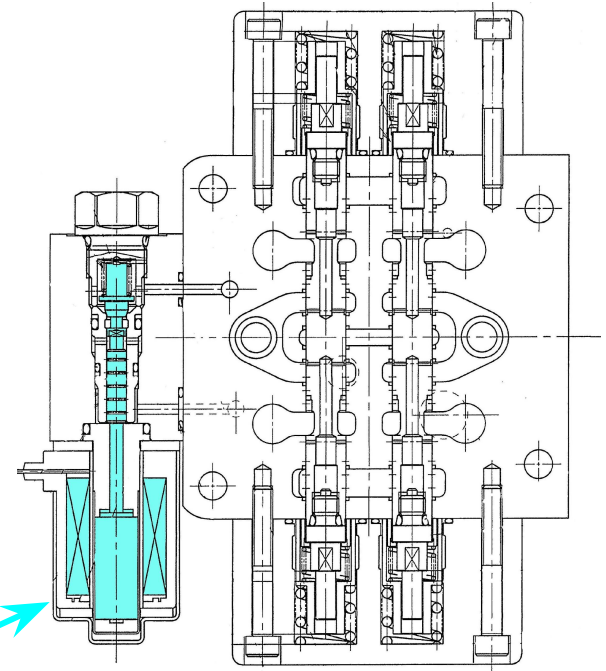
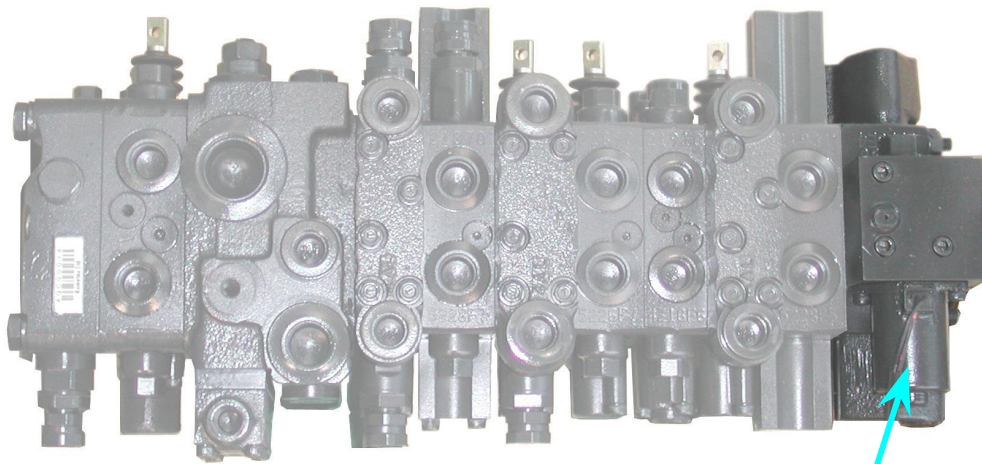
Hydraulic System : Control Valve



Customer Service Department

Hydraulic System : Control Valve





Side shift