



Accumulator

What is a Battery

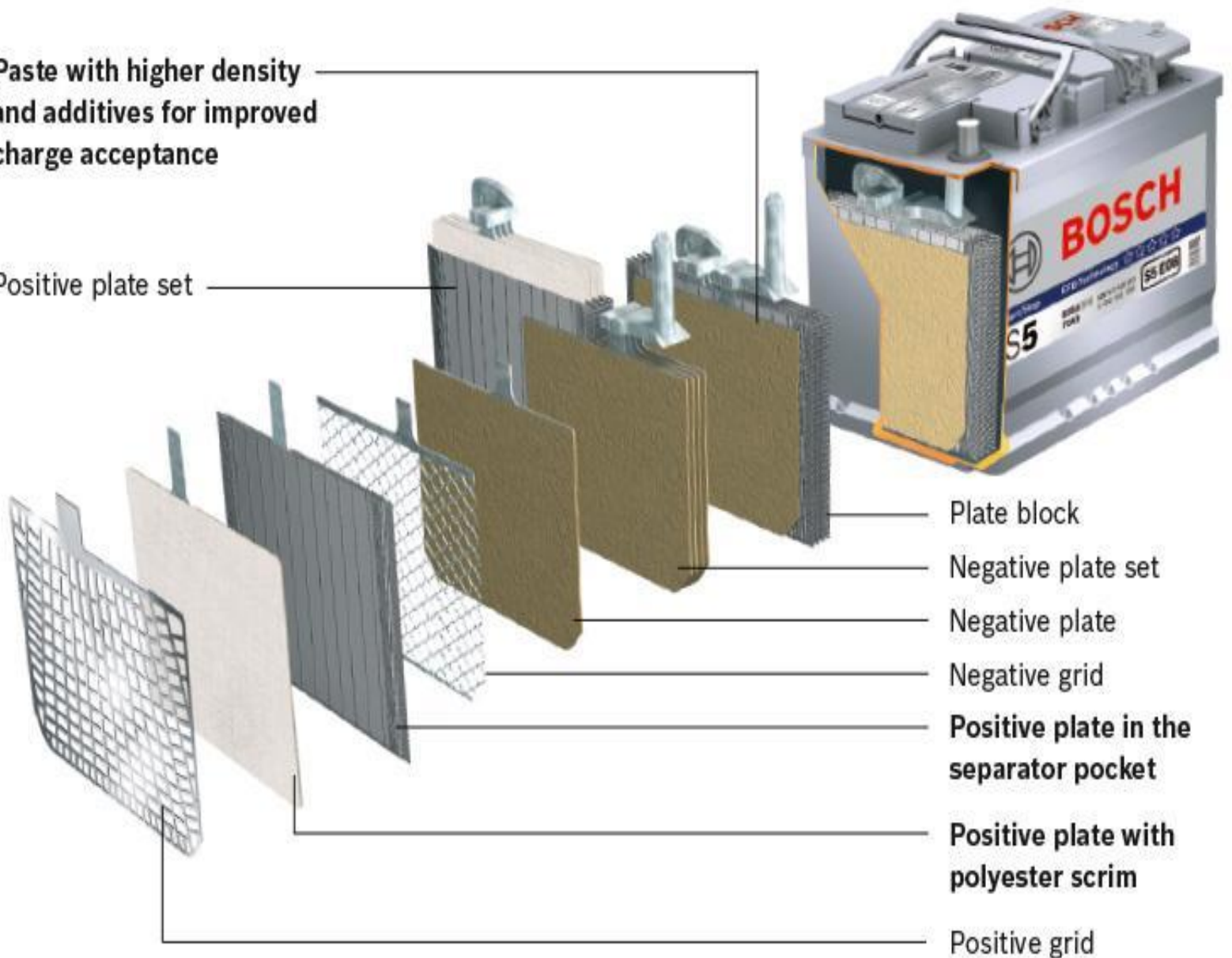
collection of one or more electrochemical cells in which stored chemical energy is converted into electrical energy



EFB battery technology

Paste with higher density
and additives for improved
charge acceptance

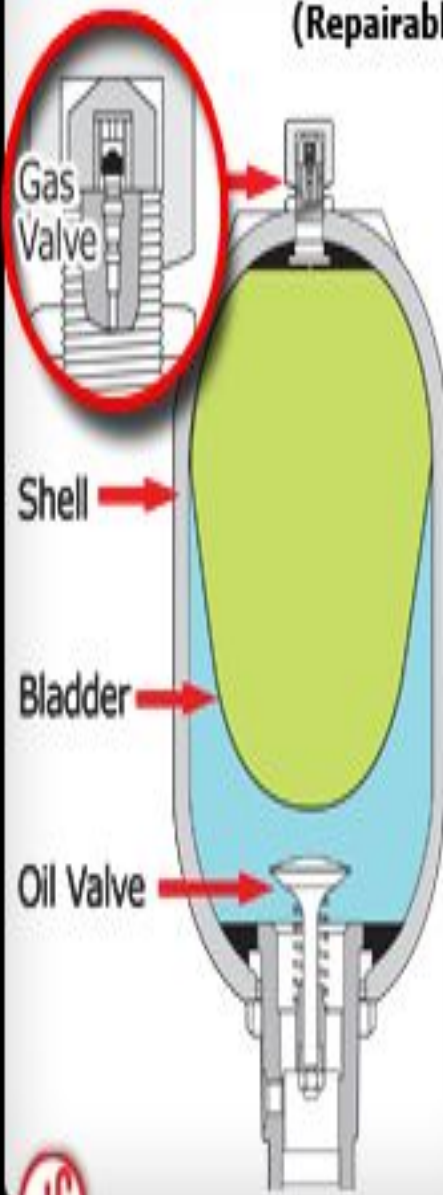
Positive plate set



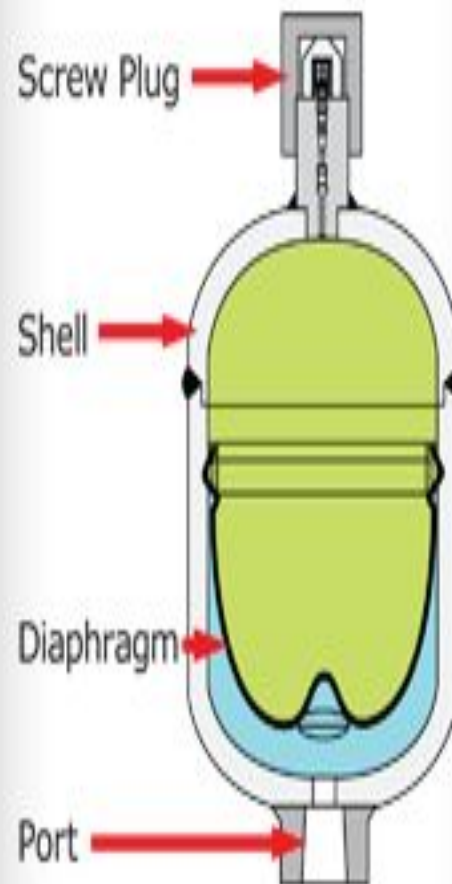
Accumulator Types

- Weight Loaded Types
- Sealed Piston Type
- Bladder Type
- Load Used for Stabilization in Construction Equipment
- Diaphragm Type
- Piston Type

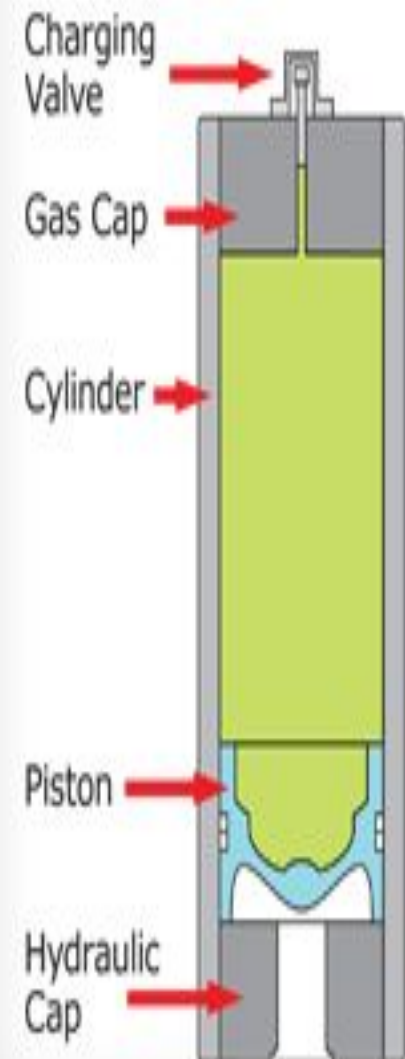
Bladder Type Accumulator (Repairable)



Diaphragm Type Accumulator (Non-Repairable)



Piston Type Accumulator




The volume of the gas chamber

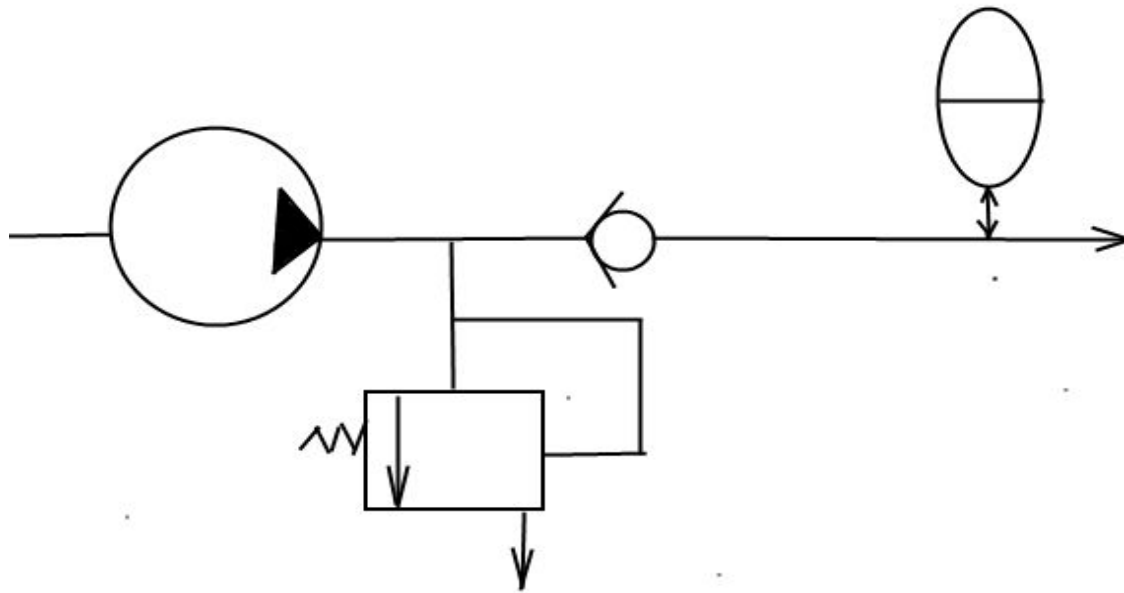
$$V = V_{\kappa} (p_o / p_{\max})$$

p_o - *Pre-filled pressure accumulator*

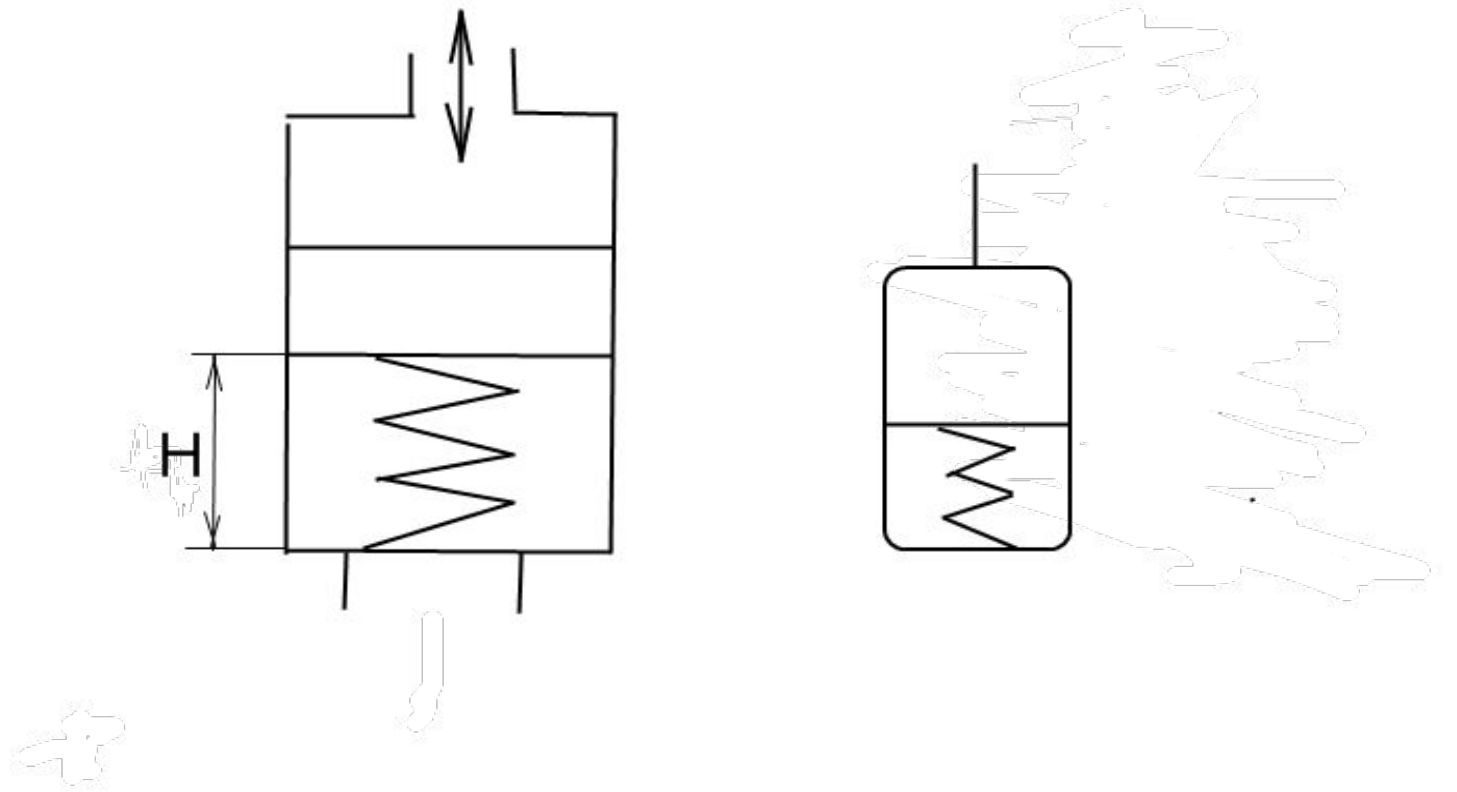
p_{\max} - *the maximum pressure of the accumulator*



**Hydraulic
accumulator-*the
hydraulic power drive in
order to use the
working fluid pressure
exceeds the energy
storage device.***



Add hydraulic accumulator scheme



The scheme of the spring-loaded accumulator

The volume of the spring-loaded accumulator

$$V = \rho S^2 / c$$

ρ -the density of the spring

s -the piston area


c -the severity of the spring

The spring-loaded pressure

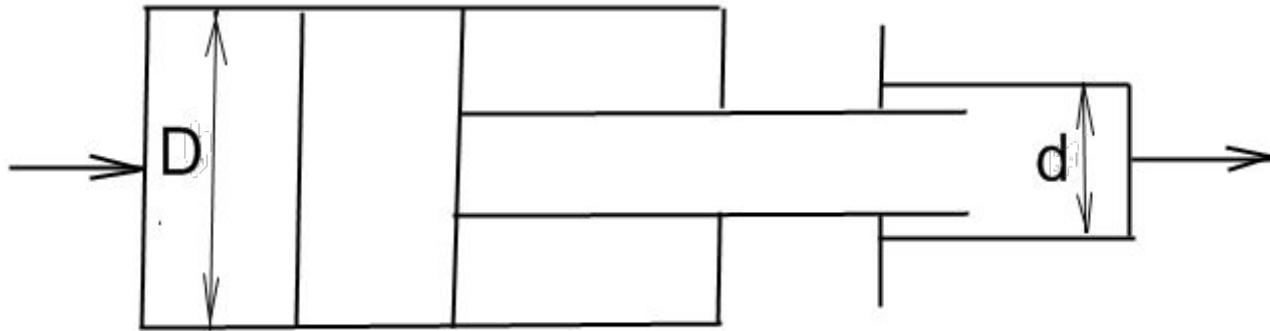
$$**P=R_{\text{ПР}}/S**$$

***$R_{\text{ПР}}$ - the Compression spring
breathing***

S - the piston area



**Assigned to the
high-pressure amplifier
multiplier or pressure
transducers are used to
increase the pressure on
the hydraulic power
drive.**



The pressure multiplier scheme

1. TOWER TYPE ACCUMULATOR

- The first accumulators for Armstrong's hydraulic dock machinery were simple raised water tower.
- It uses hydraulic head
- It delivers constant pressure to the output



LONDON TOWER BRIDGE



THANKS