

FLUID SYSTEMS

Hydraulic Systems

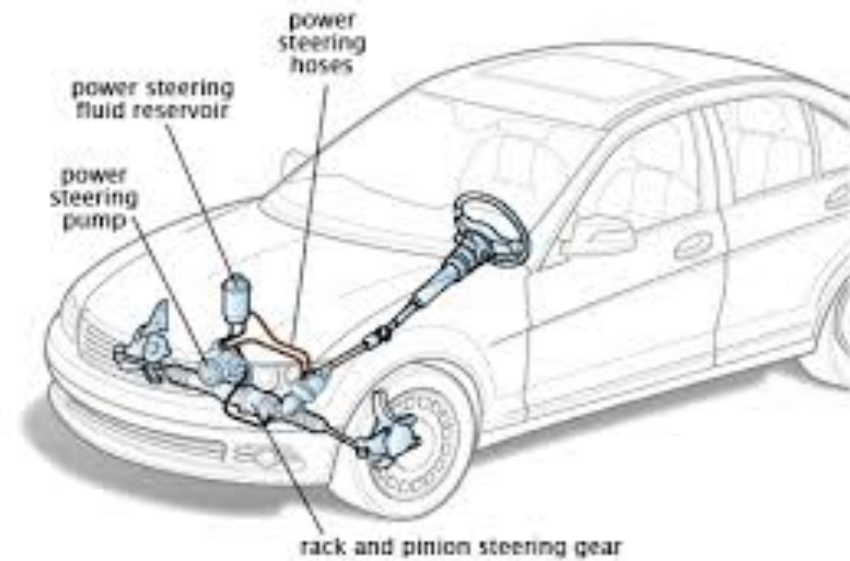


Image courtesy of ClearMechanic.com

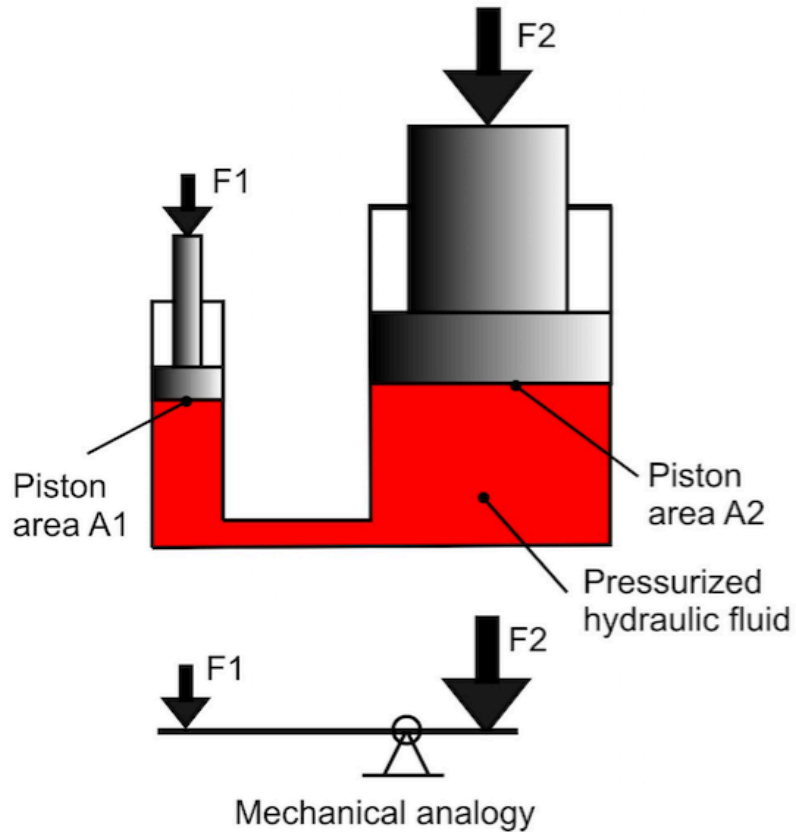
Pneumatic Systems



Hydraulic and Pneumatic Systems

- Start with an input of energy and connect various components to perform a useful task
- The energy source may be driving an electric motor which converts mechanical forces into fluid forces by operating a pump (hydraulic) or compressor (pneumatic)
- At the end of the system there is an actuator to convert the fluid force back into a mechanical force.
- All components must form a circuit through which the fluid can flow.
- These systems are used because they provide a mechanical advantage, particularly as a result of Pascal's Principle.

Force increase with hydraulics
 $F_2 = F_1 \cdot (A_2/A_1)$



Torque increase with hydraulics
 $T_{\text{motor}} = (V_{\text{motor}}/V_{\text{pump}}) \cdot T_{\text{pump}}$

