

Why to take Hydraulics ?

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Hydraulics in general is a drive technology and insofar the fluid power part of the drive section within mechanical engineering. As such it can be sub-divided into (1) "**Hydraulic Actuating/Control**" and (2) "**Power Hydraulics/Transmission**", wherever a given power is to be distributed to various users, or where high forces are needed at certain speeds.

1. Hydraulic Actuating/Control mostly is used to adjust certain motions (x-y-z axes) of mechanical movements to reach and hold a position (height, width, direction, angle etc.)

as there is e.g. the positioning of a tractor plough to reach and keep the right depth, width and angular position when ploughing.



Such positioning requires only little power, and once the position has been reached no more power is necessary to keep the position, unless changed work conditions require real re-adjustment.

Hydraulic Actuating, therefore, needs only little power supply as long as adjustments take place, so normally such systems are considered to be of the small power range.

2. Power Hydraulics/Transmissions is used to move or energize sizeable machinery, vehicles etc. to allow certain motions or high forces like driving the chains or swivel upper wagons of excavators, their lifting cylinders etc. In such cases, considerable power supply may be needed.

Power Hydraulics, therefore requires to fully energize a complex drive system, since high forces at certain speeds must be produced.



To avoid installation of excessive power, Power Hydraulics may work on the power hyperbola (e.g. speed cycle at low force, followed by a work cycle at high force, low speed) or infinitely vary flow vs. pressure to keep the installed power lowest possible.

3. Mixed Systems involve as well Hydraulic Actuating and Power Hydraulics. This is easily possible since fluids can be divided into several separate flows to cause separate operations or motions.

The Main Advantages of Hydraulics therefore comprize the following:

- Splitting one main power supply into various, individual power lines to energize various operations.
- Controlling various independent users, separately.
- Supply necessary mobile power to various users needing an external power supply.
- Create high forces and torques
- Pressurizing & Control of any other fluid
- Achieve simultaneous motions/effects
- Supply mobile electricity (lighting)
- Provide compressed air (breathing air, pneumatics, foaming)
- Pressure Water Techniques at ultra high pressure
- Light Design & Miniaturizing in general.

The driving vehicle simultaneously can carry the necessary fluid to be carried along.

5. Creating Mobility as of Vehicles:

- Utility Applications of Vehicles
 - High Pressure Cleaning
 - High Pressure pipe cleaning
- Producing Mobile Electricity to power
 - electric Do-It-Yourself Equipment
 - lighting the area concerned
 - doing commercial & communal jobs
- Pressure Water Techniques
 - Water Jetting Applications
 - Cleaning Techniques
 - Jet Abrasion like Concrete Repair & Demolition
- Powering Mobile Machinery
 - Street Sweepers
(Front Beamer & High Pressure Cleaning)
 - Rock Bolt (Mountain) Roof Support
 - Concrete Pumps and Mixers
- Drives in inflammable areas (injection moulding)
- Fire fighting & Rescue
 - Pure Water Jetting
 - High Pressure Fire Fight & Foam
 - Insulating Electric Solar Modules when jetting
 - Driving Rescue Tools 720 bar/10,000 psi

The costs of Hydraulics mostly are considered to be rather high if only one operation is energized. However, if a multitude of operations is energized by the same energy source, hydraulics can become rather inexpensive /affordable since no separate power engine is required per individual application, including just a multitude of various flows/pressures/fluids. . This saves energy, weights and installation space.

aquadraulic

Narzissenweg 4, 39291 Möser
Tel. +49 (0)39222- 688127, Fax. 684502
E-Mail : info@aquadraulic.com
Internet : www.aquadraulic.com



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