Transmission Systems

Pneumatic

Sample Pneumatic Layout
Pneumatic Transmission Systems

• Pneumatic systems are power systems using compressed air as a working medium for the power transmission.

• Their principle of operation is similar to that of the hydraulic power systems.

• An air compressor converts the mechanical energy of the prime mover into, mainly, pressure energy of the compressed air.

• This transformation facilitates the transmission, storage, and control of energy.
Sample Pneumatic Layout

- Air Tank
- Pre-Filter
- Air Dryer
- Final Filter
- Manual Ball Valve
- Filter/Regulator/Lubricator
- Oil/Water Separator
- Drip Leg Drain
- Timer Drain Valve
- Air Compressor
- Air Hose
- Air Tools
Hydraulics verses Pneumatics

- Precise control of velocity is achievable in hydraulics while due to compressible nature of gas, Pneumatics cannot have precise control over velocity.

- In Hydraulics, self-regulation action of oil can be used while in pneumatics oil mist has to be used for lubrication.

- The pressure range for hydraulics is 500-5000 psi

- The pressure range for pneumatics is below 100 psi

- The air after performing work can be sent into atmosphere, whereas oil has to be discharged into a tank.
Advantages of Pneumatics

- **Simplicity** of design and control—Machines are easily designed using standard cylinders and other components, and operate via simple on-off control.

- **Reliability**—Pneumatic systems generally have long operating lives and require little maintenance. Because gas is compressible, equipment is less subject to shock damage. Gas absorbs excessive force, whereas fluid in hydraulics directly transfers force. Compressed gas can be stored, so machines still run for a while if electrical power is lost.

- **Safety**—There is a very low chance of fire compared to hydraulic oil. Newer machines are usually overload safe.
Advantages of Hydraulics

• Liquid does not absorb any of the supplied energy.

• Capable of moving much higher loads and providing much higher forces due to the incompressibility.

• The hydraulic working fluid is basically incompressible, leading to a minimum of spring action.

• When hydraulic fluid flow is stopped, the slightest motion of the load releases the pressure on the load; there is no need to "bleed off" pressurized air to release the pressure on the load.
Pneumatic Screen Wash
Cushioning the Impact!
Video (1.5Min)

- [https://www.youtube.com/watch?v=MpgrDgFz-RA](https://www.youtube.com/watch?v=MpgrDgFz-RA)
- [https://www.youtube.com/watch?v=u8SeytYcw4E](https://www.youtube.com/watch?v=u8SeytYcw4E) Wooden Can Crusher

Pneumatic Aluminum Can Crusher
The Ultimate Can Crusher (5Min)

- https://www.youtube.com/watch?v=lFbUR2EH1oc

THOR 5000 - The ultimate Can-Crusher (Dosenpresse)
Pneumatics – Video (8 Min)

- https://www.youtube.com/watch?v=icoclK-Pv8Q
Discuss Advantages and Disadvantages of Pneumatic Transmission

- PSI lower than hydraulic
- Cheap to generate
- Minimum environmental impact
- Except Noise
Pneumatic Control (48Min)

- https://www.youtube.com/watch?v=5q7YasmwXCs
Pneumatic Software Simulation

• Virtual Pneumatics
Beer Pneumatics (3Min)

- [https://www.youtube.com/watch?v=-hzM8lJnb2M](https://www.youtube.com/watch?v=-hzM8lJnb2M)
Pneumatic Animation (6Min)

- [https://www.youtube.com/watch?v=ixjXjyJlbtk](https://www.youtube.com/watch?v=ixjXjyJlbtk)

![Pneumatic System Animation](image_url)
Pneumatic Education
Pneumatic Grain Blower

https://www.youtube.com/watch?v=eSMk5gL9A1I
Pneumatic Tube Cash System
(5min each)

- https://www.youtube.com/watch?v=0_BCeWbHMBg (Schmutzberger)
- https://www.youtube.com/watch?v=ZvPs578y0QA (Colombo)
- https://www.youtube.com/watch?v=BFNqDTNvlqw (Aerocom)
Sewage Pumping Station (2 Min)

- https://www.youtube.com/watch?v=8ROFfOxypno
Pneumatics in Industry
Pneumatic Septic Tank Truck

- [https://www.youtube.com/watch?v=nzJb3XM6mFg](https://www.youtube.com/watch?v=nzJb3XM6mFg)
Pneumatics in Production (1min)

- https://www.youtube.com/watch?v=0zllNr3Vqj4
Pneumatic Rifles

- [https://www.youtube.com/watch?v=96dR8JESCPM](https://www.youtube.com/watch?v=96dR8JESCPM) – Airarms PCP review
- [https://www.youtube.com/watch?v=5gDJSMSfrXM](https://www.youtube.com/watch?v=5gDJSMSfrXM) – Umarex Machine Gun

**REVIEW: New Air Arms S200 10-shot PCP Air Rifle**
Pneumatics Summary