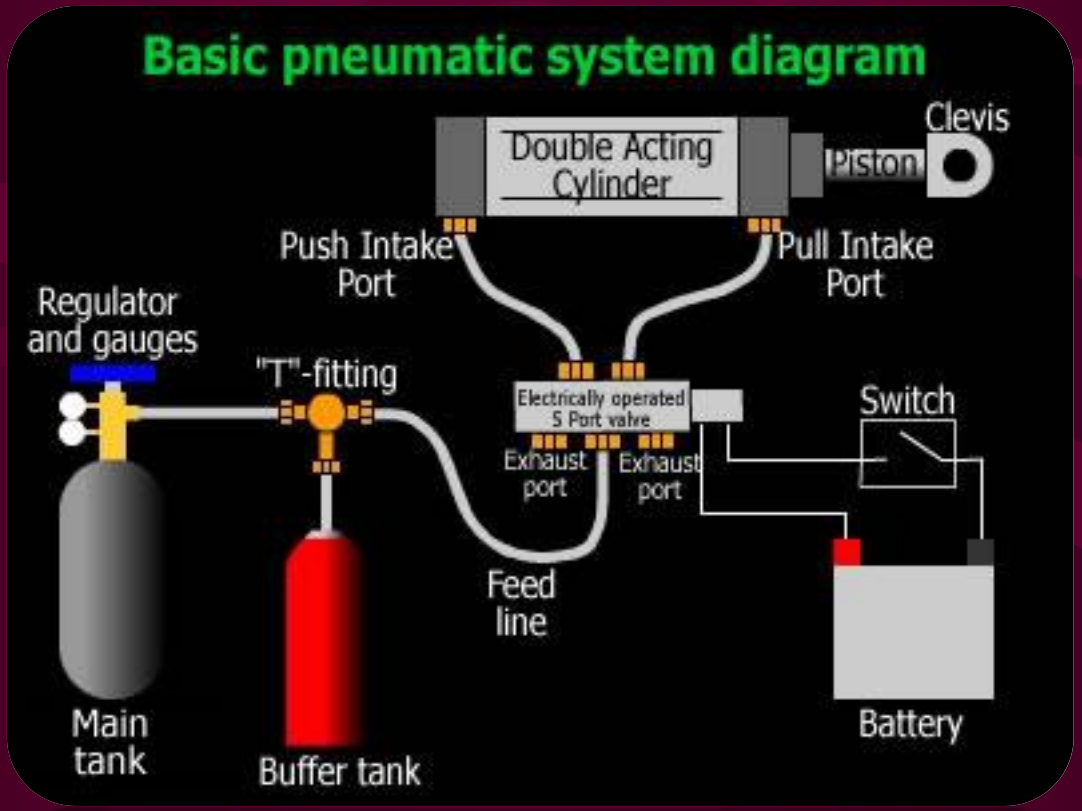
Pneumatic System



Pneumatic system

- Introduction to pneumatic system.
- Basic component in pneumatic system.
  - Compressor.
  - valve.
  - Cylinders and pneumatic motor(actuator).
- Elements of control chain.
- Pneumatic control circuit.

Introduction of pneumatic system

- A system that uses air(pressurize gases) to do mechanical motion(work).
- Pneumatics uses an easily compressible gas such as air or a suitable pure gas.
- The accomplishment of work requires the application of *kinetic energy* to a resisting object resulting in the object moving through a distance.
- The energy in the pneumatic system is stored in a potential state under the form of compressed air.

Advantages of pneumatics

- Cleanliness
  - Air is used by a machine and is then exhausted to the atmosphere - no return line is necessary.
  - Any leaks will be of air
- Availability
  - Air is freely available in the pneumatics.
  - very easy to set up a manufacturing process.
- Simplicity of Design And Control
  - Control is as easy as it is simple ON - OFF type control.
- Reliability
  - Pneumatic systems tend to have long operating lives and require very little maintenance.
  - The equipment is less likely to be damaged by shock

- Storage
  - Compressed Gas can be stored, allowing the use of machines when electrical power is lost.
- Safety
  - Very small fire hazards (compared to hydraulic oil).
  - Machines can be designed to be overload safe.

Disadvantages of pneumatic system are:

- Low accuracy and control limitation because of compressibility.
- Noise pollution.
- Leakage of air can be of concern.
- Additional drying and filtering may be required.
- Difficult speed control.