Industrial Fluid Power

INT118 CH15 SCP 335 Reciprocating Compressors

1. When pressure is equalized between the airlines and the tank of an air compressor, the system is said to be "charged up."
2. When distinguished by their operating principles, there are two classifications of air compressors:
    a. Positive-Displacement is when air is confined within a closed space and then compressed by decreasing its volume.
    b. Dynamic compression is when air is accelerated by high speed rotor blades. Air pressure is raised slightly and In dynamic compression, there is no physical separation between input and output.
    c. Each type of compressor can be further classified by its construction.
3. A positive-displacement air compressor decreases the volume of air and increases its pressure.
4. The two methods of connecting a compressor drive to a compressor include direct driven and v-belt driven.
5. The discharge valves of a compressor are opened by compressed air inside the compression chamber.
6. A spring holds the movable part of a discharge valve in place.
7. A compressor that compresses air at only one end of a cylinder is called a single-acting compressor.
8. A compressor that compresses air at both ends of the cylinder is called a double-acting compressor.
9. A compressor that compresses air in more than one stage is called a multi stage compressor. A multi stage compressor will compress air to one level and then compress it again to the final pressure.
10. In a multi stage compressor, an intercooler is used to decrease the required horsepower. To improve the efficiency of an air-cooled compressor that uses finned tubes, a fan can be used to force air over the fins.
11. Counterflow is the most efficient and commonly found flow arrangement in a water-cooled intercooler. Counterflow means that the cool water is flowing in one direction and the heated air is flowing in the opposite direction so exiting air is in contact with the coolest part of the system.
12. Cylinder-wall lubrication provides two important functions, prevent piston ring wear and remove heat.
13. Splash lubrication and pressurized lubrication are the two basic methods used to lubricate a compressor. Pressurized lubrication is used for heavy-duty compressors. Pressurized lubrication uses a pump to distribute lubrication throughout the compressor.
14. Unloading is used to make a compressor easier to start. Unloading is accomplished by relieving all internal pressure.