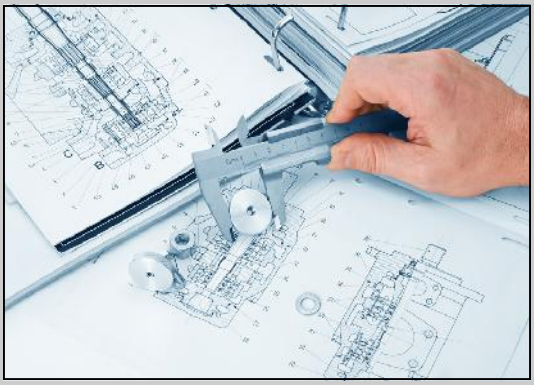
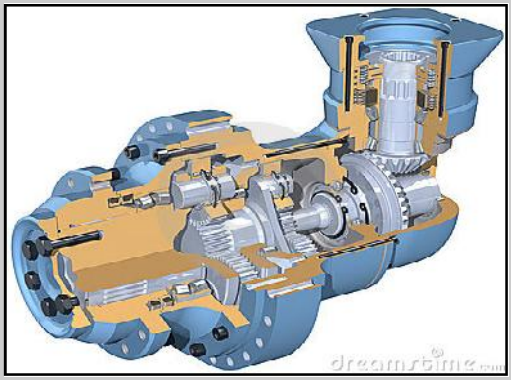
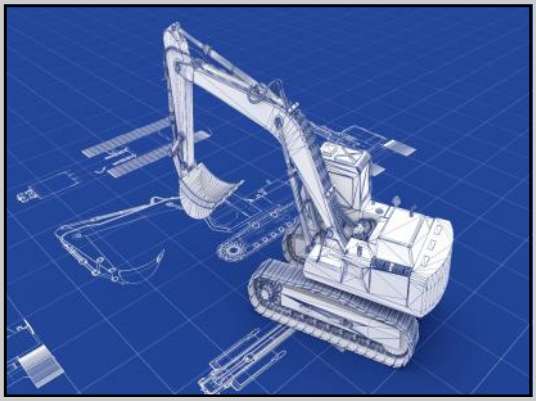
FLUID POWER GLOSSARY







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Fluid power glossary

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What is in this article?:

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- Cavitation — Cylinder, Tie Rod
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Absorption — Bulk Modulus

Absorption – The physical mechanism by which one substance attracts and takes up another substance (liquid, gas, or vapor) into its interior.

Accumulator – A container in which fluid is stored under pressure as a source of fluid power.

Accumulator, hydropneumatic bladder – A hydropneumatic accumulator in which the liquid and gas are separated by an elastic bag or bladder.

Actuator, pneumatic/hydraulic – A device in which power is transferred from one pressurized medium (pneumatic) to another (hydraulic) without intensification.

Additive – A chemical added to a fluid to impart new properties or enhance those that already exist.

Adsorption – The physical mechanism by which one substance attracts another substance (either solid, liquid, gas, or vapor) to its surface and causes the second substance to adhere to its surface.

Aftercooler – A device which cools a gas after it has been compressed.

Afterfilter – A filter which follows the compressed air dryer and usually for the protection of downstream equipment from desiccant dust.

Air – A gas mixture consisting of nitrogen, oxygen, argon, carbon dioxide, hydrogen, small quantities of neon, helium and other gases.

Air bleeder – A device for removal of air.

Air breather – A device permitting air movement between atmosphere and the component in which it is installed.

Air motor – A device which converts pneumatic fluid power into mechanical torque and motion. It usually provides rotary mechanical motion.

Air, compressed (pressurized) – Air at any pressure greater than atmospheric pressure.

Air, dried – Air with moisture content lower than the maximum allowable for a given application.

Air, free – Air at ambient temperature, pressure, relative humidity, and density.

Air, saturated – Air at 100% relative humidity, with a dew point equal to temperature.

Air, standard – Air at a temperature of 68.8° F, a pressure of 14.70 pounds per square inch absolute, and a relative humidity of 36% (0.0750 pounds per cubic foot). In gas industries the temperature of "standard air" is usually given as 60.8° F.

Amplification, power – The ratio between the output signal variations and the corresponding input (control) power variation (for analog devices only).

Amplification, pressure – Ratio between outlet pressure and inlet (control) pressure.

Amplification – The ratio between the output signal variations and the control signal variations (for analog devices only).

Analog – Of or pertaining to the general class of fluidic devices or circuits whose output varies as a continuous function of its input.

AND device – A control device which has its output in the logical 1 state if and only if all the control signals assume the logical 1 state.

Aniline point – The lowest temperature at which a liquid is completely miscible with an equal volume of freshly distilled aniline (ASTM Designation D611-07).

Aniline point – The lowest temperature at which equals volumes of pure, fresh aniline and an oil will completely dissolve in one another is the aniline point of the oil.

Bernoulli's Law – If no work is done on or by a flowing frictionless liquid, its energy due to pressure and velocity remains constant at all points along the streamline.

Bleeding – Migration to the surface of plasticizers, waxes, or similar materials to form a film or beads.

Boyle's Law – The absolute pressure of a fixed mass of gas varies inversely as the volume, provided the temperature remains constant.

Breakout Force – That force necessary to initiate sliding by overcoming static coefficient of friction. An excessive breakout force indicates the development of adhesion.

Breathing capacity – A measure of flow rate through an air breather.

Bulk modulus – The measure of a fluid's resistance to compressibility. It is the reciprocal of compressibility.

Cavitation — Cylinder, Tie Rod

Cavitation – A localized gaseous condition within a liquid stream which occurs where the pressure is reduced to the liquid's vapor pressure, often as a result of a solid body, such as a rapidly moving piston moving through the liquid. Also, the pitting or wearing away of a solid surface as a result of low fluid levels that draw air into the system, producing tiny bubbles that expand explosively at the pump outlet, causing metal erosion and eventual pump destruction.

Charles' Law – The volume of a fixed mass of gas varies directly with absolute temperature, provided the pressure remains constant.

Circuit – An arrangement of interconnected components and parts.

Cold Flexibility – Flexibility following exposure to a predetermined time.

Cold Flow – Continued deformation under stress.

Compatibility, Seal – Ability of an elastomer to resist the action of a fluid on its dimensional and mechanical properties.

Compressibility – The change in volume of a unit volume of a fluid when subjected to a unit change in pressure.

Compression Modulus – The ratio of the compressive stress to the resulting compressive strain (the latter expressed as a fraction of the original height or thickness in the direction of the force). Compression modulus may be either static or dynamic.

Compression Set – The amount by which a rubber specimen fails to return to original shape after release of the compressive load.

Compressor – A device which converts mechanical force and motion into pneumatic fluid power.

Condensation – The process of changing a vapor into a liquid condensate by the extraction of heat.

F-R-L Unit – An assembly comprising an air **filter**, pressure **regulator**, and a **lubricator**.

Conductor – A component whose primary function is to contain and direct fluid.

Contaminant – Any material or substance which is unwanted or adversely affects the fluid power system or components, or both.

Control – A device used to regulate the function of a component or system.

Controller – A device which senses a change of fluid state and automatically makes adjustments to maintain the state of the fluid between predetermined limits, e.g., pressures, temperatures, etc.

Copolymer – A polymer consisting of two different monomers chemically combined.

Creep – The progressive relaxation of a given rubber material while it is under stress. This relaxation eventually results in permanent deformation or "set."

Cushion – A device which provides controlled resistance to motion.

Cylinder – A device which converts fluid power into linear mechanical force and motion. It usually consists of a movable elements such as a piston and piston rod, plunger or ram, operating within a cylindrical bore.

Cylinder cap – A cylinder end closure which completely covers the bore area.

Cylinder capacity, extending – Volume required for one full extension of a cylinder.

Cylinder capacity, retracting – Volume (annular) absorbed by one full retraction of the cylinder.

Cylinder capacity – The volume of a theoretically incompressible fluid that would be displaced by the piston during a complete stroke. (For double acting cylinders it must be given for both directions of stroke.)

Cylinder force, theoretical – The pressure multiplied by the effective piston area, ignoring friction. For double acting cylinders, the value must be given for both directions of stroke.

Cylinder, adjustable stroke – A cylinder equipped with adjustable stops at one or both ends to limit piston travel.

Cylinder area, piston rod – Cross-sectional area of the piston rod.

Cylinder area, piston, effective – Area upon which fluid pressure acts to provide a mechanical force.

Cylinder bore – The internal diameter of the cylinder body.

Cylinder, cushioned – A cylinder with a piston-assembly deceleration device at one or both ends of the stroke.

Cylinder, differential – A double acting cylinder in which the ratio of the area of the bore to the annular area between the bore and the piston rod is significant in circuit function.

Cylinder, double acting – A cylinder in which fluid force can be applied to the moveable element in either direction.

Cylinder, double rod – A cylinder with a single piston and a piston rod extending from each end.

Cylinder, dual stroke – A cylinder combination which provides two working strokes.

Cylinder, duplex – A unit comprised of two cylinders with independent control, mechanically connected on a common axis to provide three or four positions depending on the method of application.

Cylinder, piston type – A cylinder in which the piston has a greater cross-sectional area than the piston rod.

Cylinder, plunger (ram) – A cylinder in which the piston has the same cross-sectional area as the piston rod.

Cylinder, rotary actuator – A cylinder which translates piston reciprocation into oscillation of an output shaft.

Cylinder, rotating – A cylinder in which the piston and piston rod, plunger or ram, is permitted to rotate with reference to the cylinder housing.

Cylinder, single acting – A cylinder in which the fluid force can be applied to the movable element in only one direction.

Cylinder, tandem – Arrangement of at least two pistons on the same rod moving in separate

chambers on the same cylinder body allowing the compounding of force on the piston rod.

Cylinder, telescoping – Cylinder with two or more stages or extensions, achieved by hollow piston rods sliding one within the other (may be single or double acting).

Cylinder, tie rod – A cylinder with head and cap end closures that are secured by tie rods.

Darcy's Formula — Expectancy, Life

Darcy's Formula – A formula used to determine the pressure drop due to flow friction through a conduit.

Deliquescent – Moisture is separated by using the absorptive properties of special hygroscopic compounds.

Desiccant – Material that tends to remove moisture from compressed air.

Dew point – The temperature at which vapors in a gas condense. For practical purposes, it must be referred to a stated pressure.

Digital – Of or pertaining to the general class of fluidic devices or circuits whose output varies in discrete steps (i.e., pulses or "on-off" characteristics).

Displacement, volumetric – Volume absorbed or displaced per stroke of a cylinder or per cycle of a pump or motor.

Dissolved air – Air which is dispersed at a molecular level in hydraulic fluid to form a single phase.

Dissolved water – Water which is dispersed at a molecular level in hydraulic fluid to form a single phase.

Dither – A low amplitude, relatively high frequency periodic electrical signal, sometimes superimposed on the servovalve input to improve system resolution. Dither is expressed by the dither frequency (Hz) and the peak-to-peak dither current amplitude.

Droop – The deviation between no flow secondary pressure and secondary pressure at a given flow.

Dryer, compressed air – A device for reducing the moisture content of the working compressed air.

Durometer – 1. An instrument for measuring the hardness of rubber. Measures the resistance to the penetration of an indentor point into the surface of rubber. 2. Numerical scale of rubber hardness.

Efficiency – Ratio of output to the corresponding input.

Elasticity – The property of a material which tends to return to its original shape after deformation.

Elastomer – Any synthetic or natural material with resilience or memory sufficient to return to its original shape after distortion.

Elongation – Generally means “ultimate elongation” or percent increase in original length of a specimen when it breaks.

Emulsion, oil in water – A dispersion of oil in a continuous phase of water.

Emulsion, water in oil – A dispersion of water in a continuous phase of oil.

Emulsifier – additive that promotes formation of a stable mixture, or emulsion, of oil and water.

Emulsion – A homogeneous dispersion of two immiscible liquids, generally of a milky or cloudy appearance.

Entrained air – A mechanical mixture of air bubbles having a tendency to separate from the liquid phase.

Expectancy, life – The predicted working period during which a component or system will maintain a specified level of performance under specified conditions. Sometimes expressed in statistical terms as a probability.

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Filter — Frequency Response

Filter – 1. A device whose primary function is the removal by porous media of insoluble contaminants from a liquid or a gas. 2. Chemically inert, finely divided material added to the elastomer to aid in processing and improve physical properties.

Filter, strainer – A coarse hydraulic filter usually of woven wire construction. This may be in the form of a complete filter or just an element.

Filter, by-pass (reserve) A filter which provides an alternate unfiltered flow path around the filter element when a preset differential pressure is reached.

Filter, spin-on – A filter with spin-on element sealed in its own pressure housing for independent mounting to the filter.

Filtration ratio (βm) – The ratio of the number of particles greater than a given size (β) in the influent fluid to the number of particles greater than the same size (m) in the effluent fluid.

Fitting – A connector or closure for fluid power lines and passages.

Fitting, compression – A fitting which seals and grips by manual adjustable deformation.

Fitting, flange - A fitting which utilizes a radially extending collar for sealing and connection.

Fitting, flared – A fitting which seals and grips by a pre-formed flare at the end of the tube.

Fitting, flareless – A fitting which seals and grips by means other than a flare.

Flash point – The temperature to which a liquid must be heated under specified conditions of the test method to give off sufficient vapor to form a mixture with air that can be ignited momentarily by a flame.

Flip flop – A digital component or circuit with two stable states and sufficient hysteresis so that it has "memory." Its state is changed with a control pulse; a continuous control signal is not necessary for it to remain in a given state.

Flow characteristic curve – The change in regulated (secondary) pressure occurring as a result of a change in the rate of air flow over the operating range of the regulator.

Flow rate – The volume, mass or weight of a fluid passing through any conductor per unit of time.

Flow, laminar (streamline) – A flow situation in which fluid moves in parallel lamina or layers.

Flow, output – Flow rate discharged at the outlet port.

Flow, turbulent – A flow situation in which the fluid particles move in a random fluctuating manner.

Flow – Movement of fluid generated by pressure differences.

Fluid capacity – The liquid volume coincident with the "high" mark of the level indicator.

Fluid friction – Friction due to the viscosity of fluids.

Fluid logic – A branch of fluid power associated with digital signal sensing and information processing, using components with or without moving parts.

Fluid miscibility – Capacity of fluids to be mixed in any ratio without separation into phases.

Fluid power system – A system that transmits and controls power through use of a pressurized fluid within an enclosed circuit.

Fluid power – Energy transmitted and controlled through use of a pressurized fluid.

Fluid stability – Resistance of a fluid to permanent changes in properties.

Fluid stability, oxidation – Resistance of a fluid to permanent changes caused by chemical reaction with oxygen.

Fluid, anti-corrosive – A fluid containing metal corrosion inhibitors.

Fluid, aqueous – A fluid which contains water as a major constituent besides the organic material. The fire resistance properties are derived from the water content.

Fluid, fire resistant – A fluid difficult to ignite which shows little tendency to propagate flame.

Fluid, hydraulic – A fluid suitable for use in a hydraulic system.

Fluid, Newtonian – Fluid having a viscosity that is always independent of the rate of shear.

Fluid, pneumatic – A fluid suitable for use in a pneumatic system, usually air.

Fluid, rust protection – Capacity of a fluid to prevent the formation of rust under specified conditions.

Fluid – A liquid, gas or combination thereof.

Force motor – A type of electromechanical transducer having linear motion used in the input stages of servovalves.

Free air – Any compressible gas, air or vapor trapped within a hydraulic system that does not condense or dissolve to form a part of the system fluid.

Free water – Water droplets or globules in the system fluid that tend to accumulate at the bottom or top of the system fluid depending on the fluid's specific gravity.

Frequency response – The changes, under steady-state conditions, in the output variable which are caused by a sinusoidal input variable.

Gauge Damper —Hydrostatics

Gauge damper (snubber) – A device employing a fixed or variable restrictor inserted in the pipeline to a pressure gage, to prevent damage to the gage mechanism caused by rapid fluctuations of fluid pressure.

Gauge protector – A device inserted in the pipeline to a pressure gage and arranged to isolate the pressure gage from the fluid pressure if this exceeds a predetermined limit. The device can usually be adjusted to suit the range of the pressure gage.

Gauge, bourdon tube – A pressure gage in which the sensing element is a curved tube that tends to straighten out when subjected to internal fluid pressure.

Gauge, diaphragm – A gage in which the sensing element is relatively thin and its inner portion is free to deflect with respect to its periphery.

Gauge, instrument – An instrument or device for measuring, indicating, or comparing a physical characteristic.

Gauge, pressure – A gage which indicates the pressure in the system to which it is connected.

Head – The height of a column or body of fluid above a given point expressed in linear units. Head is often used to indicate gage pressure. Pressure is equal to the height times the density of the fluid.

Head, cylinder – The cylinder end closure which covers the differential area between the bore area and the piston rod area.

Head, friction – The pressure required to overcome the friction at the interior surface of a conductor and between fluid particles in motion. It varies with flow, size, type and condition of conductors and fittings, and the fluid characteristics.

Head, pressure – The pressure due to the height of a column or body of fluid.

Head, static – The height of a column or body of fluid above a given point.

Heat exchanger – A device which transfers heat through a conducting wall from one fluid to another. (Typically to cool a system.)

Heater – A device which transfers heat through a conducting wall from one fluid to another. (Typically to warm up a system.)

Hose, wire braided – Hose consisting of a flexible material reinforced with woven wire braid.

Hose – A flexible line or conductor whose nominal size is its inside diameter.

Hydraulic amplifier – A fluid device which enables one or more inputs to control a source of fluid power and thus is capable of delivering at its output an enlarged reproduction of the essential characteristics of the input. Hydraulic amplifiers may utilize sliding spools, nozzle-flappers, jet pipes, etc.

Hydraulic motor – A device which converts hydraulic fluid power into mechanical force and motion. It usually provides rotary mechanical motion.

Hydraulic motor efficiency, hydromechanical – Ratio of the effective torque to the derived torque.

Hydraulic motor efficiency, overall – Ratio of the output power to the effective hydraulic power.

Hydraulic motor efficiency, volumetric – Ratio of the derived output flow to the effective input flow.

Hydraulic motor, fixed displacement – A hydraulic motor in which the displacement per unit of output motion cannot be varied.

Hydraulic motor, flow, input – Flow rate crossing the transverse plane of the inlet port.

Hydraulic motor, gear, external – A motor having two or more external gears.

Hydraulic motor, gear, internal – A motor with an internal gear in engagement with one or more external gears.

Hydraulic motor, gear – A motor in which two or more gears act in arrangement as working members.

Hydraulic motor, vane – A motor in which the fluid under pressure acting on a set of radial vanes causes rotation of an internal member.

Hydraulic stepping motor – A hydraulic motor which follows the commands of a stepped input signal to achieve positional accuracy.

Hydraulics – Engineering science pertaining to liquid pressure and flow.

Hydrodynamics – The engineering science which governs the movement of liquids and the forces opposing that movement.

Hydrokinetics – Engineering science pertaining to the energy of liquid flow and pressure.

Hydropneumatics – Pertaining to the combination of hydraulic and pneumatic fluid power.

Hydrostatic transmission – Combination of one or more hydraulic pumps and motors forming a unit.

Hydrostatics – Engineering science pertaining to the energy of liquids at rest.

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Indicator, Differential Pressure — Ozone Resistance

Indicator, differential pressure – An indicator which signals a difference in pressure between two points in a fluid power system.

Inhibitor – Any substance which, when present in very small proportions, slows, prevents or modifies chemical reactions such as corrosion or oxidation.

Intensification, ratio of – The ratio of the secondary pressure to the primary pressure or of the primary flow rate to the secondary flow rate.

Intensifier, double acting – A unit which magnifies the secondary fluid pressure regardless of the direction of flow of the primary fluid.

Intensifier, single acting – A unit which only magnifies the fluid pressure in one direction of flow of the primary fluid.

Intensifier, single shot – An intensifier in which the continuous application of primary fluid at the inlet port can only give a limited volume of secondary fluid.

Intensifier – A device which converts low pressure fluid power into higher pressure fluid power.

Joint - A line positioning connector.

Joint, rotary – A joint connecting lines which have relative operational rotation.

Leakage rate – The rate at which a gas or liquid passes through a barrier. Total leakage rate includes the amounts that diffuse or permeate through the material of the barrier as well as the amount that escapes around it.

Line, return – A pipe (conductor) to return the working fluid to the reservoir.

Line, working – A line which conducts fluid power.

Line – A tube, pipe, or hose for conducting fluid.

Lubricator – A device which adds controlled or metered amounts of lubricants into a fluid power system.

Magnetic plug – A plug which attracts and holds ferromagnetic particles.

Manifold – A conductor which provides multiple connection ports.

Maximum inlet pressure – The maximum rated gage pressure applied to the inlet port of the regulator.

Memory – Tendency of a material to return to original shape after deformation.

Meter-in Circuit – A speed control circuit in which the control is achieved by regulating the supply flow to the actuator.

Meter-out Circuit – A speed control circuit in which the control is achieved by regulating the exhaust flow from the actuator.

Modulus of elasticity – One of the several measurements of stiffness or resistance to deformation, but often incorrectly used to indicate specifically static tension modulus.

Modulus – Tensile stress at a specified elongation. (Usually 100% elongation for elastomers.)

Moving parts logic – The technology of achieving logic control by means of fluid devices having moving parts.

Muffler – A device for reducing gas flow noise. Noise is decreased by back pressure control of gas expansion.

Newt – A unit of kinematic viscosity in the English system. It is expressed in square inches per second (see Stokes).

NOR device – A control devices which has its output in the logical 1 state if and only if all the control signals assume the logical 0 state.

NOT device – A control device which has its output in the logical 1 state if and only if the control signal assumes the logical 0 state. The NOT device is a single input NOR device.

Oil swell – The change in volume of a rubber article due to absorption of oil or other fluid.

Open Circuit – A circuit in which return fluid is directed to a reservoir before being recirculated.

OR device – A control device which has its output in the logical 0 state if and only if all the control signals assume the logical 0 state.

Outgassing – A vacuum phenomenon wherein a substance spontaneously releases volatile constituents in the form of vapors or gases. In rubber compounds, these constituents may include water vapor, plasticizers, air, inhibitors, etc.

Output stage – The final stage of hydraulic amplifications used in a servovalve.

Ozone resistance – Ability to withstand the deteriorating effect of ozone (which generally causes cracking).

Packing — Pressure, System

Packing - A sealing device consisting of bulk deformable material of one or more mating deformable elements, reshaped by manually adjustable compression to obtain and maintain effectiveness. It usually uses axial compression to obtain radial sealing.

Pascal's Law – A pressure applied to a confined fluid at rest is transmitted with equal intensity throughout the fluid.

Permanent set – The deformation remaining after a specimen has been stressed in tension for a definite period and released for a definite period.

Permeability – The rate at which a liquid or gas under pressure passes through a solid material by diffusion and solution. In rubber terminology, it is the rate of gas flow expressed in atmospheric cubic centimeters per second through an elastomeric material one centimeter square and one centimeter thick.

Petroleum fluid – A fluid composed of petroleum oil which may contain additives and/or inhibitors.

Pipe – A conductor whose outside diameter is standardized for threading. Pipe is available in standard, extra strong, or double extra strong wall thickness.

Piston rod – The element transmitting mechanical force and motion from the piston.

Plasticizer – A substance, usually a heavy liquid, added to an elastomer to decrease stiffness, improve low temperature properties, and improve processing.

Pneumatics – Engineering science pertaining to gaseous pressure and flow.

Poise – The standard unit of dynamic viscosity in the cgs (centimeter gram second) system. It is the ratio of the shearing stress to the shear rate of fluid and is expressed in milli-pascal sec. (equals 1 centipoise).

Polymer – A material formed by the joining together of many (poly) individual units (mer) of one or more monomers; synonymous with elastomers.

Port – A terminus of a passage in a component to which conductors can be connected.

Port, differential pressure – A port which provides a passage to the upstream and downstream sides of a component.

Post cure – The second step in the vulcanization process for the more exotic elastomers. Provides stabilization of parts and drives off decomposition products resulting from the vulcanization process.

Pour point – The lowest temperature at which a liquid will flow under specified conditions (ASTM Designation D97).

Power unit – A combination of pump, pump drive, reservoir, controls and conditioning components to supply hydraulic power to a system.

Pressure – Force per unit area, usually expressed in pounds per square inch (bar).

Pressure, absolute – The pressure above zero absolute, i.e., the sum of atmospheric and gage pressure. In vacuum related work it is usually expressed in millimeters of mercury (mm-Hg).

Pressure, atmospheric – Pressure exerted by the atmosphere at any specific location. (Sea level pressure is approximately 14.7 pounds per square inch absolute. 1 bar = 14.5 psi).

Pressure, back – The pressure encountered on the return side of a system.

Pressure, breakloose (breakout) – The minimum pressure which initiates movement.

Pressure, burst – The pressure which causes failure of and consequential loss of fluid through the product envelope.

Pressure, charge – The pressure at which replenishing fluid is formed into a fluid power system.

Pressure, control range – The permissible limits between which system pressure may be set.

Pressure, cracking – The pressure at which a pressure-operated valve begins to pass fluid.

Pressure, differential (pressure drop) – The difference in pressure between any two points of a system or a component.

Pressure, gage – Pressure differential above or below ambient atmospheric pressure.

Pressure, induced – Pressure generated by an externally applied force.

Pressure, inlet – The pressure at the apparatus inlet port.

Pressure, intensified – In a fluid power cylinder, the outlet pressure required to slow the piston rod extending under regulated pressure introduced at the cap end.

Pressure, maximum inlet – The maximum rated gage pressure applied to the inlet.

Pressure, nominal – A pressure valve assigned to a component or system for the purpose of convenient designation.

Pressure, outlet – Pressure at the apparatus outlet port.

Pressure, override – The difference between the cracking pressure of a valve and the pressure reached when the valve is passing its rated flow.

Pressure, peak – The maximum pressure encountered in the operation of a component.

Pressure, pilot – The pressure in the pilot circuit.

Pressure, precharge – The pressure of compressed gas in an accumulator prior to the admission of a liquid.

Pressure, proof – The non-destructive test pressure, in excess of the maximum rated operating pressure, which causes no permanent deformation, excessive external leakage, or other resulting malfunction.

Pressure, rated – The qualified operating pressure which is recommended for a component or system by the manufacturer.

Pressure, shock – The pressure existing in a wave moving at sonic velocity.

Pressure, static – The pressure in a fluid at rest.

Pressure, surge – The pressure resulting from surge conditions.

Pressure, system – The pressure which overcomes the total resistances in a system. It includes all losses as well as useful work.

Pump — Rotation

Pump – A device which converts mechanical torque and motion into hydraulic fluid power.

Pump, fixed displacement – A hydraulic pump in which the volume displaced per cycle cannot be varied.

Pump, gear, external – Pump with two or more external gears.

Pump, gear, internal – Pump with an internal gear in engagement with one or more external gears.

Pump, gear – Pump in which two or more gears act in engagement as pumping members.

Pump, hydraulic – A device which converts mechanical force and motion into hydraulic fluid power.

Pump, multiple stage – Two or more hydraulic pumps in series.

Pump, piston, axial – Pump having several pistons with mutually parallel axes which are arranged around and parallel to a common axis.

Pump, piston, inline – Pump having several pistons with mutually parallel axes arranged on a common plane.

Pump, piston, radial – Pump having several pistons arranged to operate radially.

Pump, piston – Pump in which the fluid volume is displaced by one or more reciprocating pistons.

Pump, screw – A hydraulic pump having one or more screws rotating in a housing.

Pump, vane, balanced – Pump in which the transverse forces on the rotor are balanced.

Pump, vane, unbalanced – Pump in which the transverse forces on the rotor are not balanced.

Pump, vane – A hydraulic pump having multiple radial vanes within a supporting rotor.

Pump, variable displacement – A hydraulic pump in which the volume displaced per cycle can be varied.

Quick -Acting Coupling – A component that can quickly join or separate a fluid line repeatedly by hand without the use of tools.

Refrigerated Dryer – Moisture is separated by lowering the air temperature by means of refrigeration compressor and heat exchanger.

Regenerative Circuit – A circuit in which pressurized fluid discharged from a component is returned to the system to reduce power input requirements.

Regenerative Dryer – The capacity of the dryer to separate moisture can be restored without replacing the drying compound.

Regulator, Air Pressure – A (usually adjustable) pressure-reducing valve with pressure gauge that transforms a fluctuating air pressure supply to provide a constant, lower pressure output.

Reinforcing Agent – Material dispersed in an elastomer to improve compression, shear, or other stress properties.

Reservoir (tank) – A container for storage of liquid in a fluid power system.

Reservoir, Hydraulic – A reservoir for storing and conditioning a liquid in a hydraulic system.

Reservoir, pressure sealed – A sealed reservoir for storage of fluids under pressure.

Resilient – Capable of returning to original size and shape after deformation.

Reyn – The standard unit of absolute viscosity in the English system. It is expressed in pound-seconds per square inch.

Reynolds Number – A numerical ratio of the dynamic forces of mass flow to the shear stress due to viscosity. Flow usually changes from laminar to turbulent between Reynolds Numbers 2,000 and 4,000.

Ring, O – An elastomeric circular seal that has a round cross section.

Ring, piston – A piston sealing ring. It is usually one of a series and is often split to facilitate expansion or contraction.

Ring, scraper – A ring which removes material by a scraping action.

Rotation – The direction of rotation is always quoted as viewed looking at the shaft end. In dubious cases, provide a sketch.

More Than Seals & Cylinders……..Solutions!

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Seal, Cup — Synthetic Fluid

Seal, cup – A sealing device with a radial base integral with an axial cylindrical projection at its outer diameter.

Seal, dynamic – A sealing device used between parts that have relative motion.

Seal, elastomer – A material having rubber-like properties; i.e., having the capacity for large deformation and rapid and substantially complete recovery on release from the deforming force.

Seal, rod (shaft) – A sealing device which seals the periphery of a piston rod.

Seal, static (gasket) – A sealing device used between parts that have no relative motion.

Sensor – A device which detects and transmits changes in external conditions.

Separator – A device whose primary function is to isolate contaminants by physical properties other than size. (Separators remove gas from liquid medium or remove liquid from gaseous medium).

Sequence Circuit – A circuit which established the order in which two or more phases of a circuit occur.

Servovalve – A valve which modulates output as a function of an input command.

Servovalve, electrohydraulic – A servovalve which is capable of continuously controlling hydraulic output as a function of an electrical input.

Servovalve, electrohydraulic, flow control – An electrohydraulic servovalve whose primary function is control of output flow.

Servovalve hysteresis – The difference in the servovalve input currents required to produce the same output during a single cycle of valve input current when cycled at a rate below that at which dynamic effects are important.

Servovalve null leakage – Total internal leakage from the valve in the null position.

Servovalve, pressure control – A hydraulic servovalve whose primary function is the control of output pressure.

Shrinkage – Decreased volume of seal, usually caused by extraction of soluble constituents by fluids followed by air drying.

Silencer – A device for reducing gas flow noise. Noise is decreased by tuned resonant control of gas expansion.

Snubber – see gage damper.

Solenoid, digital – Electrically energized device which generates on-off signals.

Solenoid, proportional – An electrical device that reacts proportionally to strength of electrical signal.

Sorption – The term used to denote the combination of absorption and adsorption processes in the same substance.

Specific gravity, liquid – The ratio of the weight of a given volume of liquid to the weight of an equal volume of water.

Squeeze – Cross section diametral compression of O-ring between surface of the groove bottom and surface of other mating metal part in the gland assembly.

Stage – A hydraulic amplifier used in a servovalve. Servovalves may be single stage, two stage, three stage, etc.

Standard – A document, or an object for physical comparison, for defining product characteristics, products, or processes; prepared by a consensus of a properly constituted group of those substantially affected and having the qualifications to prepare the standard for voluntary use.

Stokes – The standard unit kinematic viscosity in the cgs (centimeter gram second) system. It is expressed in square centimeters per second; 1 centistokes equals 0.01 stokes.

Strainer – see filter, strainer.

Surface tension – The surface force of a liquid in contact with a fluid by which it tends to assume a spherical form and to present the least possible surface. It is expressed in pounds per foot or dynes per centimeter.

Surge – A transient rise of pressure or flow.

Swell – Increased volume of specimen caused by immersion in a fluid (usually a liquid).

Switch, float – An electric switch which is responsive to liquid level.

Switch, flow – An electric switch operated by fluid flow.

Switch, pressure differential – An electric switch operated by a difference in pressure.

Switch, pressure – An electric switch operated by fluid pressure.

Synthetic fluid, silicate ester – A fluid compound of organic silicates. It may contain additives.

Synthetic fluid – Fluid other than mineral on which has been artificially compounded for use in a fluid power system.

Temperature, Ambient — Vulcanization

Temperature, ambient – The temperature of the environment in which an apparatus is working.

Tensile strength – Force in pounds per square inch required to cause the rupture of a specimen of a rubber material.

Terpolymer – A polymer consisting of three different monomers chemically combined.

Tie rod – An axial external cylinder element which traverses the length of the cylinder. It is prestressed at assembly to hold the ends of the cylinder against the tubing. Tie rod extensions can be a mounting device.

Torque motor – A type of electromechanical transducer having rotary motion used in the input stages of servovalves.

Torque – Rotary force transmitted by the driving shaft of the pump.

Torr – A unit of pressure equal to 1/760 of an atmosphere.

Torricelli's Theorem – The liquid velocity at an outlet discharging into the free atmosphere is proportional to the square root of the head.

Transducer, flow – A device which converts fluid flow to an electrical signal.

Transducer, pressure – A device which converts fluid pressure to an electrical signal.

Trunnion – A mounting device consisting of a pair of opposite projecting cylindrical pivots. The cylindrical pivot pins are at right angle or normal to the piston rod centerline to permit the cylinder to swing in a plane.

Tube – A conductor whose size is its outside diameter. Tube is available in varied wall thickness and material.

Vacuum – Pressure less than ambient atmospheric pressure.

Vacuum pump – A device which uses mechanical force and motion to evacuate gas from a connected chamber to create subatmospheric pressure.

Valve – A device which controls fluid flow direction, pressure or flow rate.

Valve actuator – The valve part(s) through which force is applied to move or position flow-directing elements.

Valve, air – A valve for controlling air.

Valve, cartridge – A valve with working parts contained in a cylindrical body. The cylindrical body must be inserted into a housing for use. Ports through the body cooperate with ports in the containing housing.

Valve, directional control – A valve whose primary function is to direct or prevent flow through selected passages.

Valve, directional control, 3-way – A directional control valve whose primary function is to pressurize and exhaust a port.

Valve, directional control, 4-way – A directional control valve whose primary function is to pressurize and exhaust two ports.

Valve, directional control, check – A directional control valve which permits flow of fluid in only one direction.

Valve, directly operated – A valve in which the controlling forces acting on the element directly influence the movement of the control elements.

Valve, electrohydraulic, proportional – A valve which responds proportionally to input signals.

Valve, flow control (flow metering) – A valve whose primary function is to control flow rate.

Valve, flow control, bypass – A pressure compensated flow control valve which regulates the working flow diverting surplus fluid to reservoir or to a second service.

Valve, flow control, deceleration – A flow control valve which gradually reduces flow rate to provide deceleration.

Valve, flow control, pressure compensated – A flow control valve which controls the rate of flow independent of system pressure.

Valve, flow dividing, pressure compensated – A flow dividing valve which divides the flow at a constant ratio regardless of the difference in the resistances of the branches.

Valve, flow dividing – A valve which divides the flow from a single source into two or more branches.

Valve, hydraulic – A valve for controlling liquid.

Valve, needle – A flow control valve in which the adjustable control element is a tapered needle. Its usual purpose is the accurate control of the rate of volume of flow.

Valve, pilot operated (indirect) – A valve in which a relatively small flow through an integral vent line relief (pilot) controls the movement of the main element.

Valve, pilot – A valve applied to operate another valve or control.

Volume change – A change in the volume of a seal as a result of immersion in a fluid expressed as a percentage of the original volume.

Vulcanization – A thermo-setting reaction involving the use of heat and pressure, resulting in greatly increased strength and elasticity of rubber-like materials.

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