HYDRO PNEUMATIC PRESSURE CONTROL MECHANISM FOR HYDRAULIC PRESSURE

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ABSTRACT: - A hydro pneumatic pressure is a pressure that uses air and oil during operation and gives a higher outlet pressure at lower inlet pressures. In this project, the press was designed and manufactured by pressing sliding bearing against a circular casting. The cast is a thick steel cylinder, and the sliding bearing is a cylindrical bearing. The press uses two drives: one for the vertical pressure and one for the horizontal press. In this article we will discuss the concept of press, development, and analysis and production development. Model the different parts of the press using the Pro-E modeling software. Structure analysis was applied to the components of the press using ANSYS analysis software.

KEYWORDS :- Press Machine, Hydro Pneumatic Pressure, Hydraulic Pressure, cylinder's energy, linear motion

I. BASIC HYDRAULIC SYSTEMS

Regardless of function and design, each hydraulic system has a minimum number of basic components in addition to the means through which the fluid passes. The basic system includes pumps, accumulators, directional valves, control valves, safety valves, check valves, drives and filters.

II. OPEN THE CENTRAL HYDRAULIC SYSTEM

An open center system is a fluid flow system, but there is no pressure in the system when the control mechanism is in standby mode. The pump circulates fluid from the reservoir through the selection valve to the reservoir. In this configuration, the pressure line passes through the system through each of the selection valves. The liquid is always free to pass through each of the selection valves and return to the reservoir until one of the selection valves activates the mechanism. When a selection valve is installed to run the

drive, fluid is pumped from one of the working lines to the drive. When the selection valve is in this position, fluid is prevented from flowing into the reservoir through the valve. Resistance builds in the system, overcomes resistance and moves the cylinder's piston. Liquid from the other end of the drive returns to the selector and returns to the tank. The operation of the system after component operation depends on the type of valve selected. Different types of selection valves are used in conjunction with an open center system. Turn one type on and off manually. First, slide the valve manually into the operating position. Then the actuator reaches the end of the operating cycle and the pump output continues until the system safety valve releases the pressure. The safety valve is released and the liquid returns to the tank. The pressure in the system remains at the set pressure of the safety valve until the changeover valve is manually reset. This action restarts the open center flow and the pressure in the system can be reduced to line resistance pressure. The manual reset valve corresponds to the valve described above. When the control mechanism reaches the end of the cycle, the pressure continues to rise to the preset pressure. The valve automatically returns to neutral and opens the intermediate flow.

III. CLOSED-CENTER HYDRAULIC SYSTEMS

In a closed central system, the fluid is pressed under the pump. The three actuators are connected in parallel, the operating units B and C work simultaneously, and the working unit A does not work. This system differs from the open center system, as the selector or control valves are arranged in parallel rather than in series. The means for controlling the pump pressure vary in a closed central system. If a constant output pump is used, the pressure in the system is controlled by the pressure regulator. The safety valve can be used as backup protection when the controller fails. When using a variable shear pump, the pressure in the system is controlled by the built-in pump mechanism compensator. The compensator automatically changes the volume. When the pressure approaches the normal pressure in the system, the compensator begins to reduce the pump flow. When the normal pressure in the system is reached, the pump is fully compensated (almost zero current). When the pump is fully compensated, the internal bypass mechanism circulates through the

pump for cooling and lubrication. The safety valve is connected to the system as a secure backup. The advantage of an open center system over a closed central system is that continuous pressure regulation in the system has disappeared. As the pressure gradually increases after the switching valve has moved to the operating position, the pressure jump actually has no influence. This operation provides a smoother control of the operating mechanism. This work will be slower than a closed central system where pressure can be achieved when the valve is installed. As most flight applications require instant operation, the most common centralized system is.

IV. HYDRAULIC DRIVE SYSTEM

Smaller aircraft have a relatively low load on the flight control plane, and the pilot can manually control the flight. The hydraulic system is used in the aircraft's initial braking system. As the plane begins to fly faster and grows, the pilot can not move the work area manually and the system increases the hydraulic force introduced. The power supply system helps the pilot to overcome high work, but the pilot activates flight control via a cable or a pusher. Many modern aircraft use electrical systems and control aircraft through wires. Pilot inputs are sent electronically to power steering service. Do not use cables or buttons. The compact power supply is the latest development in hydraulic systems. Eliminate hydraulic lines and large amounts of hydraulic oil to reduce weight. Some manufacturers have reduced the hydraulic system on the aircraft to an electronic control system. Boeing 787 - the first aircraft developed with a large number of electrical systems instead of hydraulic systems.

V. HYDRAULIC FUSES

The hydraulic fuse is a safety device. The fuse can be mounted in a strategic position in the hydraulic system. A sudden increase in current is detected, such as the current downward point and stop of the fluid flow. The fuse closure provides hydraulic fluid for the rest of the system. A hydraulic fuse is connected to the braking system and front cover and is tested by the raised line, shipper, upper and lower parts of the pressure line and returned to the pressure detector. One type of fuse, also known as auto reset, is designed to provide a certain amount of fluid per. Minute. If the volume of the fuse fuse becomes too high, the fuse is off and the power is off. When the pressure on the pressure side of the fuse drops, it automatically returns to the

open position. The fuse is usually cylindrical and has an inlet and an outlet at both ends.

VI. PRESSURE CONTROL VALVE

The safe and efficient operation of fluid flow systems, system components and associated equipment requires a pressure control device. There are many types of automatic pressure valves. Some of them are pressure outputs above the set pressure. Others can only reduce the pressure of high pressure systems or low pressure systems. Some people keep the pressure in the system within the required range.

VII. VENTILATION VALVE

Hydraulic pressure must be controlled so that it can be used to perform the required work. An overpressure valve is used to limit the pressure applied to the supplied liquid. This is necessary to prevent breakage or breakage of the hydraulic line where the pressure is too high. The safety valve is actually the safety valve in the system. The design of the pressure relief valve contains a spring loaded adjustable valve. They exceed the preset maximum value of the pressure line regulated by the hydraulic valve by setting the return line to the tank. Different brands and safety valves are used, but they normally use all spring-loaded valves driven by hydraulics and spring tension.

VIII. PNEUMATIC POWER SYSTEM MAINTENANCE

Maintenance of pneumatic systems includes maintenance, troubleshooting, disassembly of components and installation as well as operational testing. Lubrication of the air compressor should be checked daily according to the manufacturer's instructions. The oil level is indicated by a glass glass or sensor. When refilling the compressor tank it will be added to the oil level (the type specified in the corresponding manual). After refueling, make sure to tighten the filler cap and install the safety wire correctly. The pneumatic system is cleaned regularly, contaminating components and pipes, and you need to remove moisture or oil. To flush the system, install the system under pressure and remove the hose from the different system components. Under high pressure, high flow air is generated by the system to remove foreign matter from the pitch removal system. Special oil must be cleaned or replaced by removing pipes and components from excess foreign matter before using it in any system. After cleaning the pneumatic system, after connecting all

parts of the system, the air bottle must be cleaned to the order system to remove any moisture and impurities collected at the bottom. After venting the air cylinder, the system is maintained by nitrogen or clean dry compressed air. The system must undergo thorough checking of performance, leaks and safety checks.

IX. MEDIUM VOLTAGE SYSTEM

Pneumatic systems with medium pressure (50 to 150 psi) typically do not include an air bottle. Instead, air is typically drawn from the compressor part of the turbine engine. If the hydraulic system is equipped with which method (commonly called aeration initiate wing motor, engine, glaze glaze, to supply pneumatic energy and to provide hydraulic power the aircraft hydraulic system a hydraulic actuator in some cases). Pump). The engine exhaust is also used to seal the reservoir on the hydraulic system. The exhaust system is described in detail in the power supply manual. Pneumatic systems are usually compared with hydraulic systems, but this comparison can only be used for general conditions. Pneumatic system for the construction of atmospheric pressure vessels, manual pumps, batteries without regulators or motor drives or electric pumping power. However, some components have similarities.

X. INTERCONNECTED PNEUMATIC PRESS MACHINE

Food systems are related to each other due to economic and nutritional continuity. Fuel costs, production constraints, line capacitors, pre-spinning and area commitments are important for interrelated work. Due to the special features to be solved in relation to standalone power supply systems, such as load balancing, minimized frequency errors, reliable power supplies and so on. D. Interestingly, the increased amount of connection and the increased vibration of the total inertia are reduced.

XI. THE PRINCIPLE OF MUTUAL RELATIONS

When connecting two or more independent electrical systems, it is important to note that the generator has the same effect in both areas. All areas are connected with communication lines. Each zone controls its own load fluctuations.

XII. MANAGEMENT AREA

The IEEE standard (1991) defines a control area as a component or combination of

different energy systems under common control of a defined definition of a region. The power connection system can be divided into several load-rate monitoring tools called control areas. Each control area is connected to a connection line. The figure shows control area 1 and control area 2 connected to a connection line. If the generator in the control zone is subject to external interference (eg, a slight change in load), all generator turbines will work with other equipment. Therefore, all blocks in the control zone are represented by a corresponding inertia. Various control areas are associated with relatively weak connections. As the connected network is strong, all loads in the control area are treated as a load.

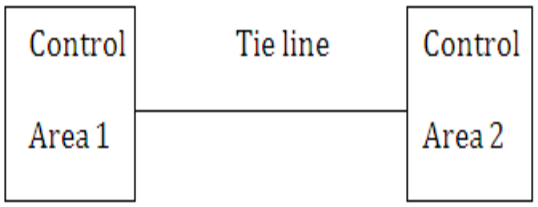

Figure 1: control Area

XIII. DESIGN OF PRESS MACHINE

Capacity of press machine:-Material (Tensile strength) =385000000 N/m^ Material length (mm) = 25mm Material thickness (mm) =10mm Width of die (mm)=80mm**.** The main objective of the control zone concept is to ensure optimum coupling performance. The various functions for implementing this operation are described below.

Under normal circumstances, in addition to the planned relationship between the production capacity and the adjacent areas, each control area must be able to bear its own load. In an emergency, you can take power from spider reserves in all nearby areas due to a sudden shutdown.

Therefore, the interconnected electrical system in operation requires that the load rate regulator in each zone not only suppresses the frequency shift, but also performs an exchange over the communications line. In short, the network exchange is defined as the algebraic sum of the communication lines between all control areas.

To share with other areas, adjacent areas are connected to a connection line. If the management area is a group, two processes are started. Firstly, all generators in the control area are considered to be inconsistent. Secondly, the frequency deviation.

XIV. PERFORMANCE ANALYSIS

If the pneumatic system is considered to be more efficient than the hydraulic system than the hydraulic system, the press develops after having undergone the pneumatic, hydraulic and hydraulic systems. The system has shown significant improvements in various sectors, such as uptime and operating costs. It has been noted that runtime for each component has been reduced from 3 hours to 30 minutes, and operating costs are reduced by approx. 90%. Another advantage of the system is the safety of the user, which makes the operation more convenient (less fatigue) and improves the dimensional accuracy associated with the positioning components. By using compressed air as an energy source you can get cheap and cheap components and pipelines. This helps to complete the hydraulic components and the use of expensive large tanks containing a large amount of expensive hydraulic fluid. Use compressed air for quick response to quick access and compression. With a fully pneumatic system and hydraulic system, you can save up to 50% energy and save 70% energy compared to hydraulic systems. The maximum load generated by the machine frame is 10 tonnes and 251 MPa, and the maximum load value for this load is 2.5 mm. This is almost the same as the yield strength (250 MPa) of mild steel. The security factor is 0.99. This design is not protected by a particular load. The maximum load induced in the frame of the machine where the plate is not used is 611.3 MPa. The maximum distortion of this load is 3.3 mm. The maximum load caused by the machine is (611,3 MPa), which almost corresponds to the yield strength of mild steel. (250 MPa) The security factor is 0.409. This design is not protected by a particular load. According to the results obtained, the structure of the frame can handle a maximum voltage of up to 3 tonnes without a plate. Since the safety factor is less than 2, if it exceeds 3 tons, the hydraulic frame does not work. From Table 3 we can conclude that the development voltage is 115 MPa and the deformation is 0.8 mm. The safety system with a 2 ton load is 2.17, so the design is safe. The moving project is compared to the old hydraulic press. The total cost of hydraulic press is 495 rupees, and the price of the hydraulic press of the frame is reduced to 1667 rupees. Cost Reduction Factor 66 058% Mechanical or Electromechanical. These three main types of energy presses have more common features, the most widely used and studied mechanical presses. Press heavily on two large fixed beds and a moving frame. The mechanical press

operates in accordance with the principle of front and back movement. The main elements of energy transfer are the coupling and crankshaft. The motor shows the rotational motion of the flywheel and the coupling is used to connect the rotary flywheel to the crankshaft. The crankshaft transforms the rotational motion of the flywheel to a downward and upward movement. The workpiece is placed automatically or manually in the lower form and the machine cycle begins. In the downward stroke, the rod (with the upper shape) is moved to the work area. When the upper and lower dies are pressed onto the substrate, a reforming part is formed. When the shutter button is completed, the object is removed and the new machine is processed and repeated.

XV. CONCLUSION

Firstly, the fluid in the hydraulic system is used to distribute the forces and distribute their operation on different blocks. Because the fluid is almost incompressible, you can do it. Pascal's law states that the pressure applied to a portion of the sealed liquid is transferred strongly to all other components. Thus, if there are more passages in the system, the pressure can be dispensed with the liquid.

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