



Answer the following questions:

Question No. 1: (25 Marks)

- A. What are the basic components of hydraulic power system? Draw a symbolic diagram of a typical hydraulic system.
- B. What are the functions and requirements of hydraulic fluid?
- C. From the given diagram (Fig. 1).
- What does the gage read when the platen is not moving and is being suspended in mid-stroke?
 - What does the gage read when the platen is approaching the material to be pressed?
 - Assume that the system relief valve is set for 68.96 bar. What is the maximum pressing force if the platen moves through the material during the pressing operation?
 - Complete** the hydraulic circuit and name its components. **what** is the function of the pressure control valve shown in Fig. 1?

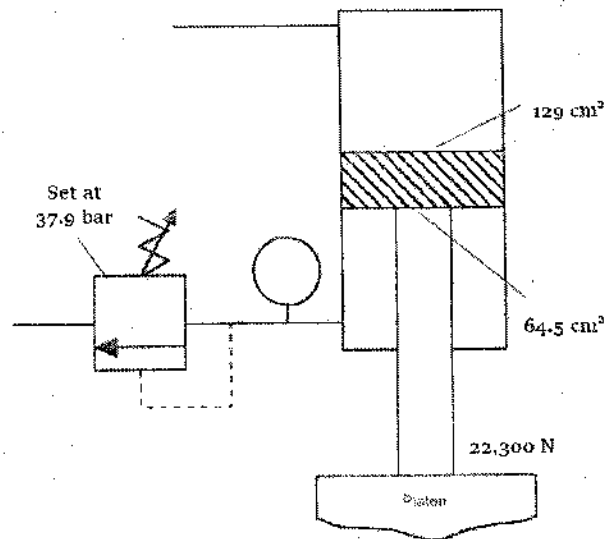


Fig. 1

Question No. 2: (30 Marks)

- A. What are the differences between spool, poppet and rotary directional control valves?
- B. What are the actuating mechanisms for directional control valves (with drawing)?
- C. What is the difference between a pressure relief valve and pressure reducing valve? Draw the construction and symbol of each valve.
- D. Explain droop in pressure reducing valve? and how to prevent it?
- E. Draw a hydraulic circuit for a press for formation of iron sheet to U shape, the circuit should include all the following requirements:
- Single acting spring return cylinder (A) to clamp the sheet.
 - Two double acting cylinders (B&C) should be able to extend together at the same time.
 - Cylinder (A) should retract after the retraction of cylinder (B&C).
 - Control the speed of cylinder (A) using meter-in flow control valve.
 - Install a filter in the suction line. This filter may be blocked with oil contamination at any instant during operation.



Question No. 3: (35 Marks)

- A. Explain the principals of operation and the possible applications of the hydraulic accumulators with net sketch.
- B. "The reservoir service not only as storage space for hydraulic fluid but also as the principal location where the fluid is conditioned" Explain the construction features of a reservoir that satisfies industry's standards, net sketch is required.
- C. Draw the construction of check valve and explain the different functions of check valve in hydraulic circuits with net sketch.
- D. For the circuit shown in Fig. 2.
 - i. Name the numbered components.
 - ii. Explain the functions of components numbered 3, 7, 11 and 12
 - iii. Describe the circuit operation.

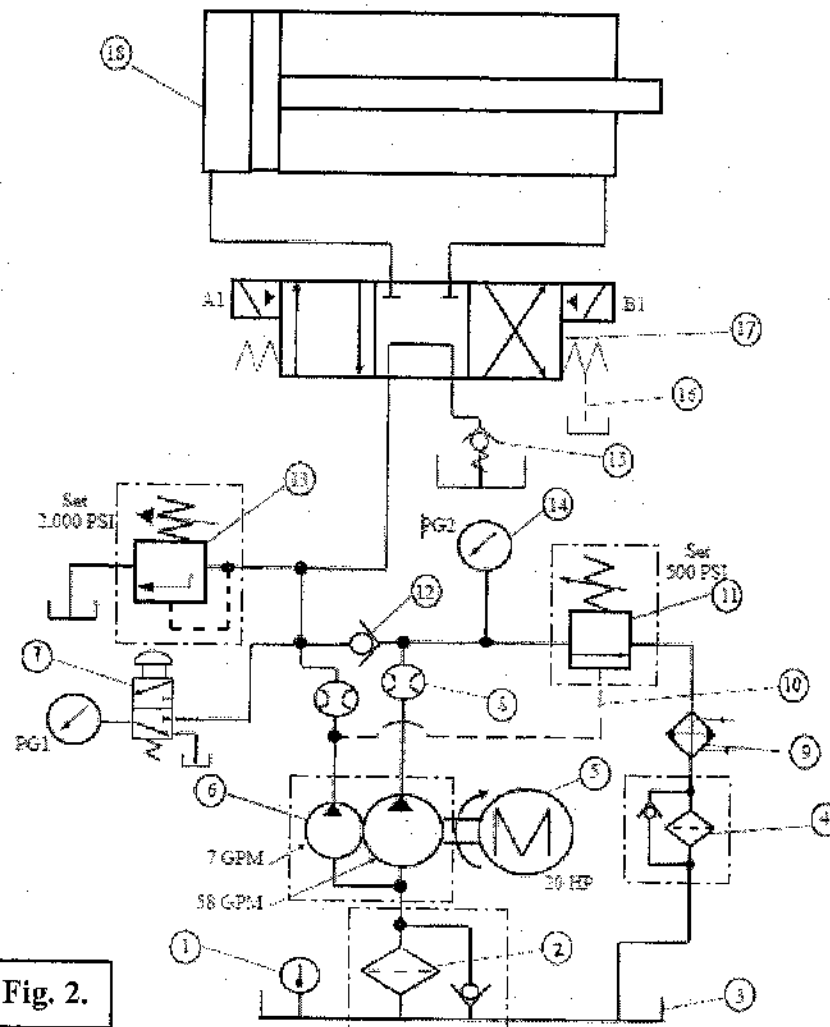


Fig. 2.

All the best,
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