

**(AG515) Hydraulic Drive & Controls**

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**Unit 1**

Hydraulic Basics: Pascal's Law, Flow, Energy, Work, and Power. Hydraulic Systems, Color Coding, Reservoirs, Strainers and Filters, Filtering Material and Elements.

**Unit II**

Accumulators, Pressure Gauges and Volume Meters, Hydraulic Circuit, Fittings and Connectors. Pumps, Pump Classifications, Performance, Displacement, Designs, Gear Pumps, Vane Pumps, Piston Pumps, Pump Operation.

**Unit III**

Hydraulic Actuators, Cylinders, Construction and Applications, Maintenance, Hydraulic Motors. Valves, Pressure-Control Valves, Directional-Control Valves, Flow-Control Valves, Valve Installation, Valve Failures and Remedies,

**Unit IV**

Valve Assembly, Troubleshooting Valves Hydraulic Circuit Diagrams and Troubleshooting, United States of American Standards Institute USASI Graphical Symbols Tractor hydraulics, nudging system, ADDC.

**Unit V**

Pneumatics: Air services, logic units, Fail safe and safety systems Robotics: Use of Hydraulics and Pneumatics drives in agricultural systems, PLCs(Programmable Logic Controls).

**TEXT BOOKS:**

1. Anthony Esposito. *Fluid Power with applications*. Pearson Education.
2. Blackburn, J.F., G. Reethof and J.L. Shearer. *Fluid Power Control*. New York, Technology Press of M.I.T. and Wiley.
3. Blaine W. Andersen. *The analysis and design of pneumatic systems*. John Wiley and Sons, Inc.
4. Ernst, W. *Oil Hydraulic Power and its Industrial applications*. New York: Mc Graw Hill.
5. Fitch, Jr., E.C. *Fluid Power Control Systems*. Mc Graw Hill, New York.
6. Hasebrink J.P., Kobler R. *Fundamentals of pneumatics/ electro pneumatics*. FESTO Didactic publication No.7301, Esslingen Germany.
7. Herbert E. Merritt. *Hydraulic control systems*. John Wiley and Sons Inc.
8. Ian Mencal. *Hydraulic operation and control of machine tools*. Ronald Press.

**REFERENCE BOOKS:**

1. John Watton. *Fluid Power Systems: modelling, simulation and micro computer control*. Prentice Hall International.
2. 10.Khaimovitch. *Hydraulic and Pneumatic control of Machine Tools*.
3. 11.Lewis, E.E., and H. Stern. *Design of Hydraulic Control Systems*. New York; Mc Graw Hill.
4. 12.Pippenger, J.J., and R.M. Koff. *Fluid Power control systems*. New York: Mc Graw Hill.
5. 13.Sterwart. *Hydraulic and Pneumatic power for production*. Industrial Press.
6. 14.Thoma Jean U. *Hydrostatic Power Transmission*. Trade and Technical Press, Surrey, England.
7. 15.Werner Deppert and Kurt Stoll. *Pneumatic control-An introduction to the principles*. Vogel-Verlag.