

Corporate Office
7042 Fairfield Business Dr.
Fairfield, OH 45014-5480
(513) 874-3225
(513) 874-3229 Fax



Level 2 Industrial Hydraulics Advanced Maintenance & Repair

Course Description: This component and control level course will incorporate component symbols learned in Level 1 into complete schematics. Remote control of pressure valves using pilot valves, bleed off orifices, and proportional controls will be discussed. Simultaneous control of multiple actuators while maintaining pressure and flow requirements will be reviewed. Operation and setup of load sense pumps will be demonstrated. Slip-in and screw-in cartridge valve design and operation will be presented. Proportional directional control valve function and use will be introduced. Closed loop hydrostatics systems, power steering, and power beyond functions will also be covered.

Prerequisites: Level 1 Industrial Hydraulics or equivalent knowledge

Textbooks: Hydraulics Manual, CFC-Solar Lab Manual, Handouts

Learning Objectives:

- Determine pressure required to a move load at given pressure. Compare area ratios for speed and force output as well as output flows.
- Determine actuator speeds for given flow and size. Use cylinder's extend and retract time to determine flow rates.
- Explain remote control techniques for relief, reducing, sequence, counterbalance, and unloading valves. Use of vent and drain ports to influence pressure control settings. Load sensing pressure controls.
- Compare pressure compensated vs. non-compensated flow control circuits. Effects of flow controls in multiple pressure systems. Review meter-in verses meter-out operations and learn how to reduce or eliminate pressure intensification problems.
- Identify/classify the different types of hydraulic pump controls. Adjustment procedures for pressure compensating, load sensing, and power limiting controls. Diagnostic procedures for variable displacement pumps. Manual displacement controls for pumps.
- Compare slip-in and screw-in cartridge valves and review circuits. Using slip-in cartridges and pilot valve to replace a two stage directional valve. Manifold trouble shooting. Identification of pilot, drain, and control ports.
- Demonstrate knowledge of hydraulic schematics to aid in diagnostics of machines. Evaluate machine response and performance with multiple simultaneous operations.