

Corporate Office

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Level 1 Mobile Hydraulics In Depth Fundamentals

Course Description: This course covers the fundamentals and principles of mobile hydraulics with emphasis on hands-on exercises. Basic fluid power principles first set a foundation. The construction, operation, and specific use of individual hydraulic components then become the focus of the class. Specific components covered in this course are actuators, pressure controls, flow controls and directional controls, cartridge valves, pumps, reservoirs, accumulators and filtration units. In addition, safety, fluid conductors, seals, leak prevention, and basic hydraulic symbols are covered.

Prerequisites: None

Textbook: CFC-Solar manual or other appropriate school manual

Equipment: CFC-Solar Hands-on Trainers; CFC-Solar component take-apart kits

Course Time allocation: 50% Hands-on, 50% power point presentation and animations

Learning Objectives:

- Recognize the construction, operation and application of actuators, pressure controls, flow controls, directional controls, pumps, cartridge valves, reservoirs, accumulators, heat exchangers, filtration units, flow meters, and gauges used on mobile equipment
- Disassemble, inspect, and reassemble pressure controls, directional valves, motors, and both fixed and variable pumps
- Identify/classify relief, reducing, sequence, counterbalance, and unloading valves
- Compare pressure compensated vs. non-compensated flow controls
- Distinguish between meter-in verses meter-out operations
- Identify/classify the different types of hydraulic pumps and power steering units
- Review how hydrostatic systems work
- Identify schematic symbols of hydraulic components covered in class
- Relate hydraulic pressure and flow
- Define Pascal's law and the terms GPM, CFM, and PSI
- Compare area ratios for speed and force output
- Identify and work with connecting lines and fittings used to carry hydraulic fluid
- Explain how to prevent leaks using proper seals and seal materials