



Level 1 Industrial Hydraulics In Depth Fundamentals

Course Description

This course correlates fluid power principles with machine operation and daily maintenance duties. Procedures to ensure safety of maintenance personnel and prevent damage to machine will be covered. Fluid power symbols will be compared to the physical components. Location of components in a hydraulic system and proper adjustment procedures will be identified. Hands-on exercises will reinforce location, proper component connections, and effects of adjustments on system operation. Elimination of leaks by proper fitting selection and installation will be discussed. Significance of fluid cleanliness to system longevity and techniques to minimize ingress of contaminants will be presented. 50% is hands-on.

Prerequisites: None

Course Length: 3 days

Textbooks: 3 ring binder, Parker IHT Textbook

Course Outline

Safety

- Safety Equipment

Hydraulic Fundamentals Review

Actuators

- Bent Rod causes and prevention
- Cylinder and Motor Sizing

Flow Controls

- Meter-in vs. Meter-out

Flow Dividers

- Various Types

Mobile and Industrial Directional Controls

- Pilot Operated check valve ratio problems
- Manifolds and Modules
- Screw-In and Slip-In Cartridge valves

Mobile and Industrial Proportional valves

- Directional, flow and pressure types

Learning Objectives

- Review PSI and GPM formulas and charts
- Explain how to control shock problems caused by pressure controls
- Explain how to remotely control pressure valves.
- Discuss why spool type directional valves leak and how to use this phenomena to improve the system design
- Explain the causes of heat generation in systems and how to reduce its effects.
- Discuss the use of non-compensated and pressure compensated flow controls.
- Explain the formula that allows the use of smaller electric motors.
- Design and select Pilot Operated check valves.
- Explain how logic valves function.
- Explain basic proportional and servo valve functions and the electrical signals needed to control.
- Explain how to control de-compression problems that cause system shock.
- Use the load sense and torque limiting pump controls to reduce heat and conserve energy.