GLOBAL TRAINING INSTITUTE

Hydraulics & Pneumatics: Essential Skills for System Efficiency



GTI - Coordination Office and International Relations (Accredited Programs)

Course Description

The Hydraulics & Pneumatics: Essential Skills for System Efficiency training Course offers participants an in-depth understanding of hydraulic power systems. Designed to be interactive, this course covers the various components of hydraulic systems, their functions, and how they interact. Participants will learn about key hydraulic components such as relief valves, pressure-reducing valves, pumps, and accumulators, as well as the principles of hydraulic circuits commonly used in industrial applications. The Course also emphasizes maintenance practices, fault recognition, and safe operation of hydraulic systems.

Who Should Attend

This course is suitable for a variety of professionals, including:

- Maintenance engineers involved in hydraulic system upkeep.
- Process and mechanical technicians working with hydraulic applications.
- Design engineers focused on hydraulic system design.
- Supervisors and operators responsible for hydraulic operations.
- Mechanical engineers seeking to enhance their knowledge of hydraulic systems.

Course Objectives

By the end of this Course, participants will be able to:

- Identify the components of hydraulic systems.
- Understand the effects of hydraulic fluids on system performance.
- Interpret hydraulic symbols and schematic diagrams.
- Describe proper operating procedures for hydraulic systems.
- Explain maintenance and troubleshooting practices for hydraulic systems.
- Recognize faults and damage in hydraulic components during inspections.
- Test hydraulic circuits to ensure safe and correct operation.

Course Content

Principles of Hydraulics and Hydraulic Fluids

- Overview of Pascal's Law and its applications.
- Main components of hydraulic systems, including filters, reservoirs, and accumulators.
- Understanding properties, types, and selection of hydraulic fluids, along with related issues.

Hydraulic Pumps and Actuators

- Classification and performance characteristics of various hydraulic pumps.
- Differences between variable and fixed displacement pumps, including gear, vane, and piston pumps.
- Overview of hydraulic cylinders and motors.

Control Valves

- Classification of control valves, including direct-acting and pilot-operated types.
- Understanding pressure control, directional control, and flow control valves.
- Application of meter-in and meter-out control techniques.

Operation and Hydraulic Circuits

- Responsibilities of hydraulic system operators.
- Interpretation of hydraulic symbols and their significance in circuit design.
- Operation of regenerative, counterbalance, and decompression circuits, along with case studies.

Maintenance and Troubleshooting of Hydraulic Systems

- Development of flow charts for hydraulic circuits.
- Techniques for troubleshooting various hydraulic components.
- Best practices for assembling, disassembling, inspecting, and testing hydraulic systems, supported by case studies.