

# Systems Using Hydraulics

## Fundamentals, Function, and Upkeep

### Introduction

Participants in this training course on Course N Carry Systems Using Hydraulics: Fundamentals, Functions and Upkeep will get a deeper comprehension and operational knowledge of hydraulic power systems. The goal of the seminar is to provide attendees with an engaging training experience that will help them comprehend the many parts of a typical hydraulic system, as well as how these parts work and interact with one another.

The main categories of hydraulic components will also be covered for the participants, along with the theory and application of pressure-reducing, directional control, fixed- and variable-displacement pumps, accumulators, and direct-and pilot-operated relief valves. It covers an understanding of the fundamental hydraulic circuits that are most frequently utilized in industrial hydraulic systems. We'll also talk about the many kinds of hydraulic fluids and their properties, as well as the hydraulic principles of mechanical maintenance.

The purpose of this Course N Carry training course is to teach participants how to check hydraulic systems, identify faults and damage to important components, modify control valves, and test hydraulic circuits to ensure proper and safe operation.

### The main points of this Course N Carry training lecture are:

- Hydraulic Power System Principles
- Issues Associated with Hydraulic Fluids
- Hydraulic Pumps with Variable and Fixed Displacement
- Fundamentals of Control Valve Operation
- Utilizing Industrial Hydraulic Systems for Basic Hydraulic Circuit Operation
- Upkeep, examination, and testing of the hydraulic system

### Objectives

#### By the time this Course N Carry training course ends, you'll know how to:

- Determine the parts of the hydraulic system.
- Understand the effects hydraulic fluids have on the parts
- Recognize and decipher hydraulic symbols
- Recognize the proper ways to operate hydraulic systems.

- Describe the general maintenance and troubleshooting procedures for the hydraulic system.

## Training Methodology

The training session on Course N Carry Hydraulic Systems will cover workshop fundamentals through interactive working examples, multimedia visuals, video clips, and presentations. The participants' abilities will be improved through group discussions. Using handouts of ISO standard symbol diagrams, a certain amount of time will be spent instructing the participants on how to comprehend and interpret hydraulic symbols and hydraulic circuits.

## Organizational impacts

**This Course N Carry training course will assist the company in the following ways:**

- Increasing personnel skill levels to improve plant dependability
- Cutting down on expensive downtime
- Increasing the plant's efficiency
- Cutting Down on Repair Expenses
- Boosting worker and plant safety
- Gaining more proficiency in troubleshooting can save time and money.

## Personal Impact

**After completing this Course N Carry training course, participants will have a solid understanding of hydraulic equipment. They'll be capable of:**

- Improve their foundational understanding of hydraulic power systems
- Recognize the elements and symbols used in schematic designs.
- Properly locating filters in hydraulic systems
- When working on hydraulic circuits with high pressure, observe proper safety procedures.
- Check hydraulic circuits for proper and secure functioning.
- Reduce expensive downtime by utilizing best practices in defect discovery techniques and procedures.

## Who should attend?

All staff involved in the operation and maintenance of hydraulic systems are intended to attend this Course N Carry Systems Using Hydraulics training program.

**A wide range of professionals can benefit from this Course N Carry training course, but the following are particularly noteworthy:**

- Engineers for Maintenance
- Technicians in Process and Mechanical
- Engineers by Design
- Operators and Supervisors
- Engineering, Mechanical

## Course Outline

### Day 1

#### Fundamentals of Fluid Dynamics and Hydraulics

- Principal Elements of a Hydraulic System Pascal's Law
- Accumulators, Reservoirs, and Filters
- Both closed and open loops
- Hydraulic Fluid Properties
- Hydraulic Fluid Types
- Adaptive Choice
- Issues Associated with Hydraulic Fluids

### Day 2

#### Actuators & Pumps in Hydraulic

- Hydraulic pump classification and performance
- Fixed and Variable Displacements Pumps that are Hydraulic
- Gear Pumps
- Pumps Vane
- Pumps with Pistons
- Load Sense Control and Pressure Compensator
- Hydraulic Units
- Motors that are Hydraulic

### Day 3

#### Control Valves: Direct-Acting and Pilot-Operated Valves: Classification

- Valves with Pressure Control
- Directional Control Valves

- Both the in and out meters

## **Day 4**

### **Operator Responsibilities for Operation and Hydraulic Circuits**

- Hydraulic Component Symbol
- How Regenerative Circuits Work
- Circuits for counterbalancing
- Circuits for Decompression
- Circuits of Hydraulics in Different Machines
- Case Studies

## **Day 5**

### **Upkeep and Diagnostics of Hydraulic Systems**

- Diagram of Hydraulic Circuit Flow
- Diagnostics of Various Hydraulic System Components
- Putting Together and Taking Apart Hydraulic Units
- Examination and Evaluation of Hydraulic Mechanisms
- Upkeep of Hydraulic Systems
- Case Studies