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Course Name

Hydraulic System in Industrial Applications: Maintenance & Troubleshooting

Sector Name

Mechanical Engineering

Document Type

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Hydraulic System in Industrial Applications: Maintenance & Troubleshooting

Course Introduction

The course will concentrate on how the participants will learn the basic hydraulic components, how they work, and their function in a hydraulic circuit. They will be able to understand and interpret hydraulic schematics and implement safe work practices.

Gain the basic skills needed to be a proactive and effective systems troubleshooter. Learn how to make minor, cost-saving repairs by seeing and understanding the operation of various components. You will practice preventive maintenance techniques that will reduce premature system failure. Also, it provides participants with a full appreciation of the different types of hydraulic systems and their characteristics. Also, provides participants with an understanding of hydraulic system design, operation, and maintenance.

This comprehensive training program consists of some video clips (Demonstration) that train students to understand the principles of hydraulic system operation, as well as how to operate, maintain, troubleshoot, and repair a variety of hydraulic equipment.

Hydraulic System in Industrial Applications: Maintenance & Troubleshooting

Target Audience

- ✓ Automotive Engineer
- ✓ Boiler Engineer
- ✓ Ceramics Engineer
- ✓ Equipment Engineer
- ✓ High-Pressure Engineer
- ✓ Marine Engineer
- ✓ Mechanical Design Engineer
- ✓ Mechanical Engineer
- ✓ Naval Architect
- ✓ Pipeline Engineer
- ✓ Power Engineer
- ✓ Rotating Equipment Engineer
- ✓ Senior Mechanical Engineer
- ✓ Turbine Engineer
- ✓ Validation Engineer

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Learning Objectives

- ✓ Be able to read and understand the Hydraulic Circuit Diagrams.
- ✓ Understand the Application of Hydraulic Systems in Industries.
- ✓ Understand the Function, Construction, and Operation of the main Hydraulic Control Components as Standard Procedures.
- ✓ Create and match a variety of Hydraulic applications to the work to be performed.
- ✓ Properly test and inspect hydraulic systems.
- ✓ Diagnose system versus component problems, causes, and root causes.
- ✓ Distinguish problem “symptoms” from the actual “cause”.
- ✓ Apply a common-sense, systematic approach to troubleshooting
- ✓ Evaluate the cause and effect of changing or re-sizing system components.
- ✓ Recommend and implement a change towards fixing the problem

Also will provide the participants with Knowledge related to Hydraulic Engineering. Understanding principles of Hydraulic system operation as well as how to operate, maintain, troubleshoot, and repair Hydraulic Systems.

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Course Outline

✓ 01 DAY ONE

Module (01) Introduction to Hydraulic Systems

- ✓ Properties of Liquids
- ✓ Hydraulic System Components
- ✓ Hydraulic Schematic Symbols
- ✓ System Flow and Pressure
- ✓ Hydraulic Power Transmission
- ✓ Hydraulic System Efficiency
- ✓ Hydraulic System Safety

Module (02) Pressure Controls

- ✓ Introduction to Pressure Control Valves
- ✓ Unloading and Counterbalance Valves
- ✓ Sequence and Pressure Reducing Valves
- ✓ Direct-Acting and Pilot-Operated PCV
- ✓ External Control of Pilot-Operated Valves
- ✓ Spool-Type Pressure Control Valves
- ✓ Pressure Reducing Valve Operation

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Course Outline

✓ 02 DAY TWO

Module (03) Directional Flow Controls

- ✓ Direction Control Valves
- ✓ Centering Conditions
- ✓ Actuating Directional Control Valves
- ✓ Piloting and Draining
- ✓ Packed Spool Valves
- ✓ Flow Control Valve Designs
- ✓ Flow Control Applications

Module (04) Fluids, Filters, and Reservoirs

- ✓ Functions of Hydraulic Fluid
- ✓ Characteristics of Hydraulic Fluid
- ✓ Fluid Conditioning in the Reservoir
- ✓ Draining and Replacing Fluid
- ✓ Reducing External Contamination
- ✓ Types of Filters
- ✓ Filter Maintenance

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✓ 03 DAY THREE

Module (05) Hydraulic Pumps and Accumulators

- ✓ Hydraulic Power 5.2 Hydraulic Pumps
- ✓ Vane Pumps 5.4 Piston Pumps
- ✓ Monitoring Pump Operation
- ✓ Hydraulic Accumulators
- ✓ Accumulator Maintenance
- ✓ Pre-charging an Accumulator

Module (06) Variable Volume Hydraulic Pumps

- ✓ Fixed Volume and Variable Volume Pumps
- ✓ Horsepower Reduction
- ✓ Variable Volume Vane Pumps
- ✓ Variable Volume Piston Pumps
- ✓ Volumetric Efficiency
- ✓ Case Drain Flow
- ✓ Electrical Checks
- ✓ Reversible Pumps

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✓ 04 DAY FOUR

Module (07) Actuators

- ✓ Hydraulic Cylinders
- ✓ Cylinder Regulation
- ✓ Cylinder Repair
- ✓ Hydraulic Motors
- ✓ Motor Regulation
- ✓ Motor Repair

Module (08) Hydraulic System Troubleshooting

- ✓ Introduction to Troubleshooting
- ✓ Using Schematic Diagrams
- ✓ Flow-Related Problems
- ✓ Cylinder Malfunction
- ✓ Edge-guide Circuit Malfunction
- ✓ Downender Malfunction
- ✓ Traversing Circuit Malfunction

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✓ 05 DAY FIVE

Module (09) Electro-hydraulic Servo Systems

- ✓ Signal Transmission
- ✓ Servo System Schematic Symbols
- ✓ Spool Servo Valves
- ✓ Jet Pipe Servo Valves
- ✓ Flapper Servo Valves
- ✓ Frequency Response Tests

Module (10) Hydraulics Troubleshooting Guide

- ✓ Valves
- ✓ Cylinders
- ✓ Boosters
- ✓ Fluid Motors
- ✓ Vane Pumps
- ✓ Radial Piston Pumps
- ✓ Hydraulic Systems

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 23, 2027	May 27, 2027	5 days	4250.00 \$	KSA , Riyadh
April 19, 2027	April 23, 2027	5 days	4250.00 \$	UAE , Dubai
Oct. 5, 2026	Oct. 9, 2026	5 days	4250.00 \$	UAE , Dubai
Jan. 18, 2027	Jan. 22, 2027	5 days	4950.00 \$	Austria , Vienna

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