MTA SKILLLAB SDN. BHD.

ELIMINATE DOWNTIME & SAFETY OPERATION

This course not just equips you with the troubleshooting skill but also to optimize your hydraulic systems reliability and recognize problem early. Properly size and maintain components, and implement a systematic approach that reduces machine stoppages and cuts energy costs

Duration: 2 days **Venue: MTA Training Center, Prai** **Time: 9am - 5pm**

COURSE TITLE: MASTER HYDRAULIC POWER & SYSTEMATIC TROUBLESHOOTING

Learning Outcomes

- Identify the main parts of a hydraulic system (pump, valve, cylinder, reservoir) & functions
- Read and trace basic hydraulic schematic diagrams
- Apply hydraulic safety protocols in maintenance operations
- Implement proper fluid handling and leak management procedures
- Perform preventive maintenance tasks following checklists
- Preform preventive maintenance tasks following checklist
- Identify opportunities for energy efficiency improvement

Who Should Join?

Courses are often tailored for industrial technicians, maintenance staff, and engineers

Learning Content

Session 1: Introduction to Hydraulic Power

Session 2 : System Components & Functions

Session 3: Reading Hydraulic schematics

Session 4 : Hydraulic safety

Session 5: Fluid and Leak management

Session 6: Preventive Maintenance Practice

Session 7: Problem Recognition & Communication

Session 8: Energy Efficiency & System Optimization

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Course Outline

DAY 1: System Fundamental & Safe Operation

Session 1 : Introduction of Hydraulic Power (90min)

- Basic principles: Pascal's Law, pressure, flow, work, power
- Hydraulic system advantages: power density, controllability, overload protection
- Main system components: reservoir, pump, valves, actuators, conductors, filters, coolers
- Open-loop vs. closed-loop systems
- Common industrial applications

Lab Exercise 1: System Walk-Through

Session 2: Hydraulic Components & Functions (90min)

- Pumps: Gear, vane, piston types; inlet conditions, cavitation
- Valves: Directional (spool, poppet), pressure (relief, reducing), flow control
- Actuators: Cylinders (single/double acting), hydraulic motors
- Auxiliary components: Filters, accumulators, heat exchangers

Lab Exercise 2: Components Identification

Session 3: Read Hydraulic Circuit (90min)

- ISO 1219 and ANSI symbol standards
- Reading circuit logic and sequence
- Interpreting manufacturer's diagrams
- Identifying diagnostic/test points

Lab Exercise 3: Schematic Tracing .

Session 4: Hydraulic Safety (90min)

- Pressure hazards: stored energy, sudden release
- Thermal hazards: hot fluid, fire risk
- Mechanical hazards: moving parts, high velocity leaks
- Safe work procedures: LOTO, bleed-down, personal protective equipment

Lab Exercise 4: Safe System Isolation

Course Outline

DAY 2: MAINTENANCE & SYSTEMATIC TROUBLESHOOTING

Session 5: Fluid Leak Management (90min)

- Hydraulic fluid types and properties
- Contamination: particles, water, air
- ISO Cleanliness Codes
- Leak types: external, internal, weeping, stream
- Seal basics and common failure points

Session 6: Preventive Maintenance Practice (90min)

- Maintenance strategies: reactive, preventive, predictive
- Developing effective checklists
- Filter maintenance: types, indicators, replacement
- Reservoir maintenance: breathers, level, temperature
- Hose and fitting inspection criteria

Lab Exercise 5: Complete a thorough PM Inspection .

Session 7: Problem Recognition & Communication (90min)

- Early failure indicators: noise, heat, leaks, slow operation
- Systematic observation and documentation
- Effective communication techniques for technicians

Lab Exercise 6 : Recognize problem early and reporting).

Session 8: Energy Efficiency & System Optimization (90min)

- Energy waste in hydraulic system
- Heat as efficiency indicator
- Proper component sizing basics
- Simple optimization: proper pressure setting, leak elimination and pump maintenance

Lab Exercise 7 : Identify energy waste in hydraulic system).