

C-255 Hydraulic Systems 1 Course Credential

About this course

This SACA certified C-255 Hydraulic Systems 1 course prepares students for a career in an industrial automated 4.0 industry environment. Participants are taught to connect, adjust, operate, and analyze hydraulic circuits using these components: quick connect fittings, tee and cross fittings, fixed displacement pumps, filters, pilot-operated and direct operated relief valves, gauges, flow meters, directional control valves, flow control valves, check valves, pressure reducing valves, sequence valves, accumulators, pressure compensated flow control valves, cylinders, and motors

Modules to be covered

1. Standard 255.1 Apply hydraulic system safety procedures
 - Performance Indicators
 - Identify and correct hydraulic system hazards
 - Knowledge Indicators
 - Describe PPE and safe dress for operation of hydraulic systems
 - Describe types of hydraulic system hazards
 - Describe hydraulic system safety guidelines
 - Define hydraulics and give applications
2. Standard 255.2 Start up and shut down a hydraulic system
 - Performance Indicators:
 - Perform startup and normal shutdown of a hydraulic power unit
 - Knowledge Indicators:
 - Describe the operation/components of a hydraulic power unit
 - Describe the basic operation of a fixed displacement gear pump
 - Describe how hydraulic energy is generated and its characteristics



- Define hydraulic pressure and give SI and US Customary units
3. Standard 255.3 Monitor hydraulic system operation
- Performance Indicators:
 - Connect and read a hydraulic flow meter
 - Connect and read a hydraulic pressure gage
 - Read a hydraulic reservoir temperature gage
 - Knowledge Indicators:
 - Describe SI and US Customary hydraulic flow measurement units
 - Describe the operation of a hydraulic flow meter
 - Describe the operation of a hydraulic pressure gage
 - State Pascal's law and explain its significance in fluid power
 - Describe the effect of temperature on a hydraulic system
4. Standard 255.4 Interpret hydraulic schematics
- Performance Indicators:
 - Interpret a hydraulic schematic in NFPA/ISO symbols
 - Knowledge Indicators:
 - Describe the guidelines for drawing hydraulic schematics
 - Describe the operation/construction of basic hydraulic components and circuits, including: directional valves (2/3/4 way; 2-3 position), cylinders (single and double acting), motors, direct-acting and pilot-operated relief valves, pressure reducing valves, accumulators, 2-stage directional control valves, pressure compensated flow control valves, and filters.
 - Describe the NFPA/ISO hydraulic component schematic symbols
5. Standard 255.5 Connect and operate basic machine hydraulic components
- Performance Indicators:
 - Operate a basic hydraulic valve circuit with manual operator
 - Use hydraulic valve manual overrides to test actuators



- Connect/disconnect hydraulic hoses using quick connect fittings
 - Install a subplate-mounted hydraulic valve
 - Knowledge Indicators:
 - Describe the operation of a hydraulic valve override
 - Describe types of hydraulic conductors
6. Standard 255.6 Connect and adjust flow control and needle valves
- Performance Indicators:
 - Connect and adjust flow control valves in meter-in and meter-out circuits
 - Connect and adjust needle valve to control hydraulic actuator speed
 - Connect and adjust a pressure-compensated flow control valve
 - Knowledge Indicators:
 - Describe the operation of a needle valve and flow control valve
 - Describe the operation of a pressure-compensated flow control valve
 - Describe fluid power speed control circuits (meter-in, out, etc.)
 - Describe the factors that affect hydraulic actuator speed
 - Calculate flow rate required to achieve a given actuator speed
7. Standard 255.7 Check and charge accumulator pressure
- Performance Indicators:
 - Charge an accumulator
 - Check accumulator charge pressure
 - Knowledge Indicators:
 - Describe how to determine accumulator charge pressure
8. Standard 255.8 Monitor performance of hydraulic system pressure and force
- Performance Indicators:
 - Measure across a hydraulic component
 - Identify factors that affect hydraulic actuator force



- Knowledge Indicators:
 - Calculate net force output of a cylinder
 - Calculate torque output of a motor
 - Describe types of resistance in a hydraulic system
 - Explain the effect of oil compressibility on hydraulic system operation
 - Describe the pressure-force-area formula

9. Standard 255.9 Perform basic hydraulic system servicing

- Performance Indicators:
 - Check oil reservoir level
 - Refill oil reservoir
 - Check pressure drop across oil filter
- Knowledge Indicators:
 - Describe the operation of a hydraulic filter

